ESTUDIO DE SINTONIZACIÓN DE ESTABILIZADORES DE SISTEMAS DE POTENCIA (PSS)

ANEXO A Informe Preliminar

GERENCIA DE OPERACIÓN

Febrero 2022

Estudio de Sintonización de Estabilizadores de Sistemas de Potencia (PSS)
Informe preparado por el Departamento de Estudios Eléctricos

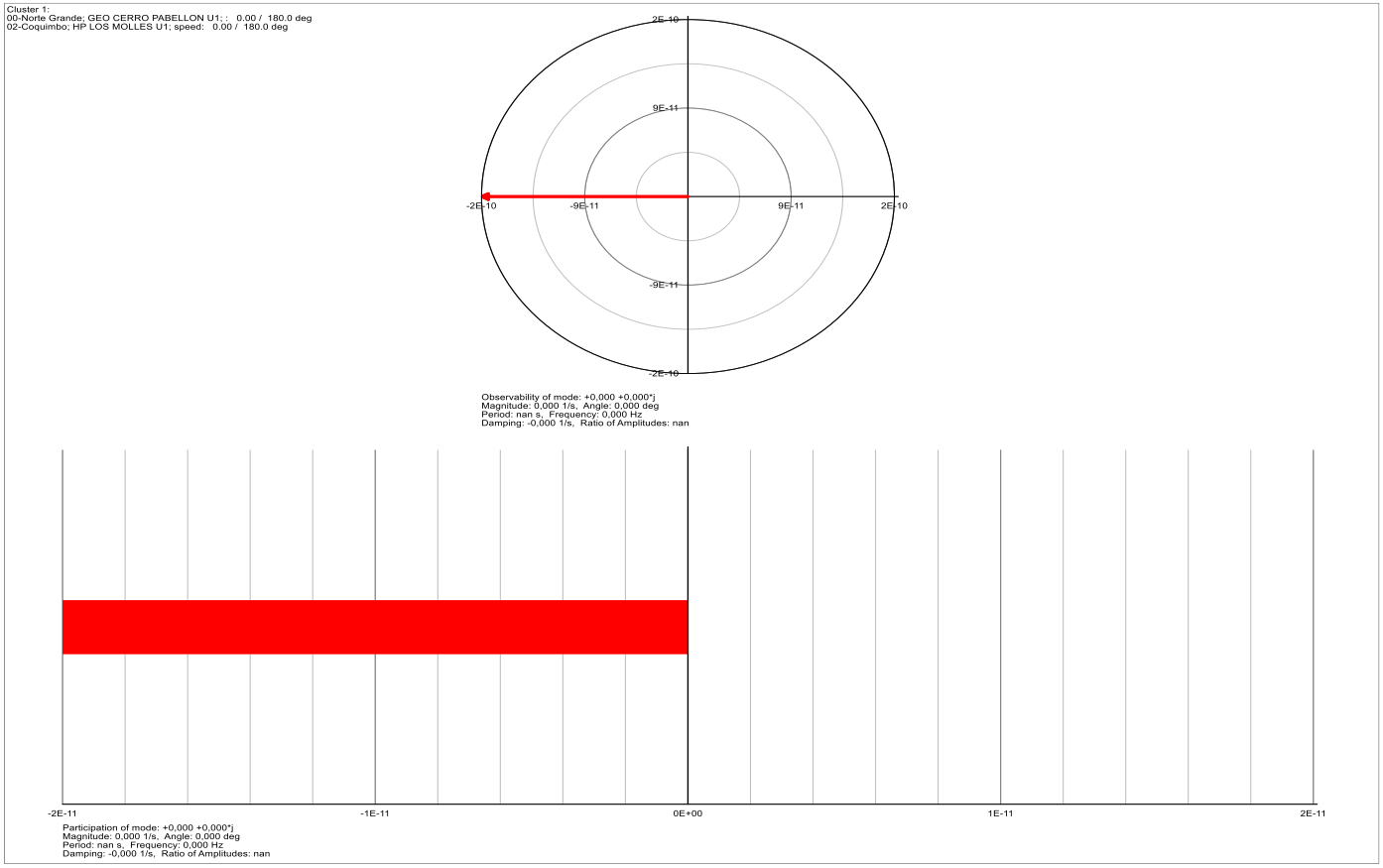
Rev.	Fecha	Comentario	Realizó	Revisó / Aprobó
1	02-02-2022	Anexos A Informe Preliminar	Hernán Barra C. Michelle Cajas R. Carlos Prieto C Gonzalo Sánchez M.	Víctor Velar

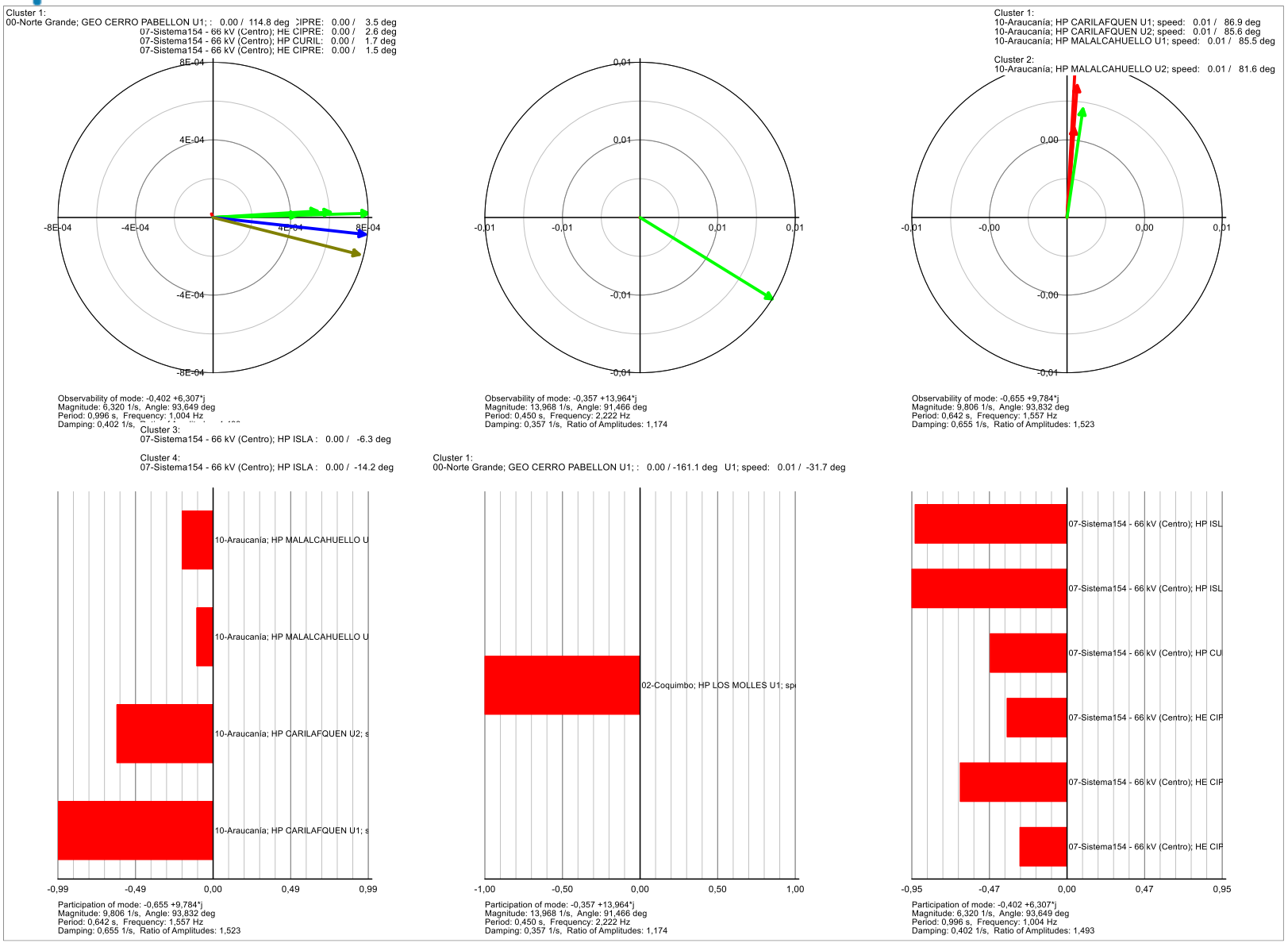
Índice

14 ANEXO 1: MODOS CRÍTICOS

14.1 Escenario E1 DA día Ene2022

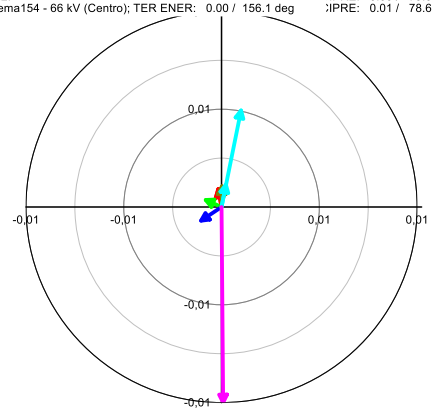
14.1.1 Red N




Cluster 1:
00-Norte Grande; GEO CERRO PABELLON U1; : 0.00 / 114.8 deg ;IPRE: 0.00 / 3.5 deg
07-Sistema154 - 66 kV (Centro); HE CIPRE: 0.00 / 2.6 deg
07-Sistema154 - 66 kV (Centro); HP CURIL: 0.00 / 1.7 deg
07-Sistema154 - 66 kV (Centro); HE CIPRE: 0.00 / 1.5 deg
Observability of mode: -0,402 +6,307*j
Magnitude: 6,320 1/s, Angle: 93,649 deg
Period: 0,996 s, Frequency: 1,004 Hz
Damping: 0,402 1/s,
Cluster 1:
10-Araucanía; HP CARILAFQUEN U1; speed: 0.01 / 86.9 deg
10-Araucanía; HP CARILAFQUEN U2; speed: 0.01 / 85.6 deg
10-Araucanía; HP MALALCAHUELLO U1; speed: 0.01 / 85.5 deg
Cluster 2:
10-Araucanía; HP MALALCAHUELLO U2; speed: 0.01 / 81.6 deg
Observability of mode: -0,357 +13,964*j
Magnitude: 13,968 1/s, Angle: 91,466 deg
Period: 0,450 s, Frequency: 2,222 Hz
Damping: 0,357 1/s, Ratio of Amplitudes: 1,174
Observability of mode: -0,655 +9,784*j
Magnitude: 9,806 1/s, Angle: 93,832 deg
Period: 0,642 s, Frequency: 1,557 Hz
Damping: 0,655 1/s, Ratio of Amplitudes: 1,523
Cluster 3:
07-Sistema154 - 66 kV (Centro); HP ISLA : 0.00 / -6.3 deg
Cluster 4:
07-Sistema154 - 66 kV (Centro); HP ISLA : 0.00 / -14.2 deg
Cluster 1:
00-Norte Grande; GEO CERRO PABELLON U1; : 0.00 / -161.1 deg U1; speed: 0.01 / -31.7 deg
10-Araucanía; HP MALALCAHUELLO U
10-Araucanía; HP MALALCAHUELLO U
10-Araucanía; HP CARILAFQUEN U2; s
10-Araucanía; HP CARILAFQUEN U1; s
02-Coquimbo; HP LOS MOLLES U1; sp
07-Sistema154 - 66 kV (Centro); HP ISL
07-Sistema154 - 66 kV (Centro); HP ISL
07-Sistema154 - 66 kV (Centro); HP CU
07-Sistema154 - 66 kV (Centro); HE CIP
07-Sistema154 - 66 kV (Centro); HE CIP
07-Sistema154 - 66 kV (Centro); HE CIP
Participation of mode: -0,655 +9,784*j
Magnitude: 9,806 1/s, Angle: 93,832 deg
Period: 0,642 s, Frequency: 1,557 Hz
Damping: 0,655 1/s, Ratio of Amplitudes: 1,523
Participation of mode: -0,357 +13,964*j
Magnitude: 13,968 1/s, Angle: 91,466 deg
Period: 0,450 s, Frequency: 2,222 Hz
Damping: 0,357 1/s, Ratio of Amplitudes: 1,174
Participation of mode: -0,402 +6,307*j
Magnitude: 6,320 1/s, Angle: 93,649 deg
Period: 0,996 s, Frequency: 1,004 Hz
Damping: 0,402 1/s, Ratio of Amplitudes: 1,493

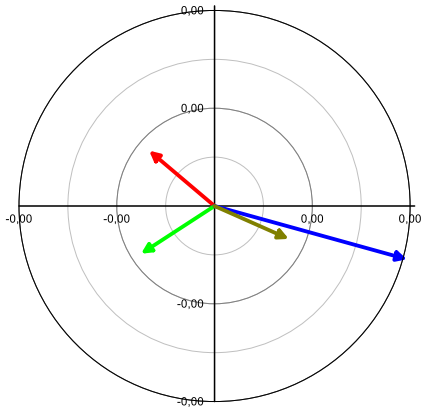
Cluster 1:
07-Sistema154 - 66 kV (Centro); HP ISLA : 0.00 / 99.7 deg
07-Sistema154 - 66 kV (Centro); HP ISLA : 0.00 / 100.6 deg

Cluster 2:
07-Sistema154 - 66 kV (Centro); TER ENER: 0.00 / 156.1 deg



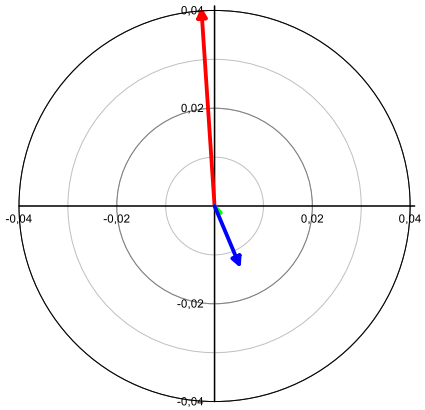
Observability of mode: -0,696 +8,543*j
Magnitude: 8,571 1/s, Angle: 94,660 deg
Period: 0,735 s, Frequency: 1,360 Hz
Damping: 0,696 1/s, Ratio of Amplitudes: 1,669

Cluster 1:
07-Sistema154 - 66 kV (Centro); HE CIPRE: 0.00 / 139.7 deg



Observability of mode: -0,765 +8,107*j
Magnitude: 8,143 1/s, Angle: 95,388 deg
Period: 0,775 s, Frequency: 1,290 Hz
Damping: 0,765 1/s,

Cluster 1:
03-Chilquinta-Aconcagua; HP LOS QUILOS U: 0.04 / 93.8 deg



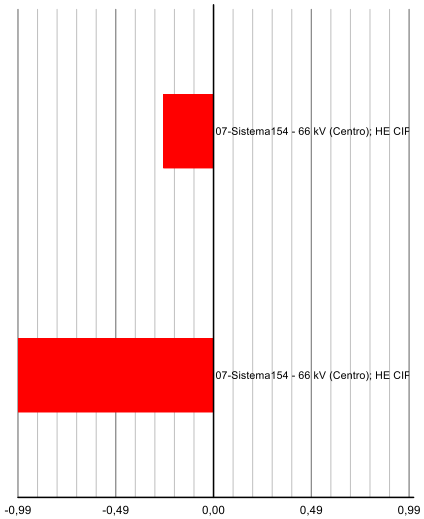
Observability of mode: -0,742 +11,148*j
Magnitude: 11,172 1/s, Angle: 93,810 deg
Period: 0,564 s, Frequency: 1,774 Hz
Damping: 0,742 1/s,

Cluster 3:
07-Sistema154 - 66 kV (Centro); HE CIPRE: 0.00 / -15.5 deg

Cluster 2:
03-Chilquinta-Aconcagua; HP LOS QUILOS U: 0.00 / -47.8 deg

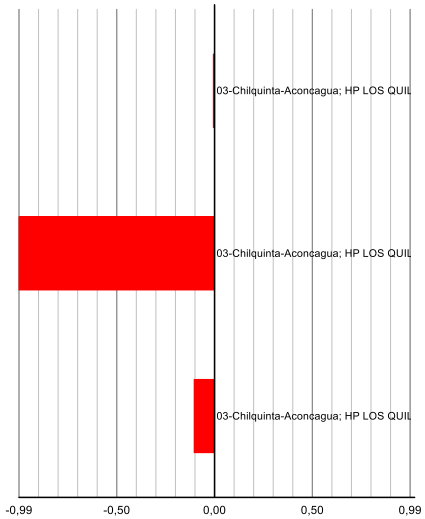
Cluster 3:
03-Chilquinta-Aconcagua; HP LOS QUILOS U: 0.01 / -67.2 deg

Cluster 3:
07-Sistema154 - 66 kV (Centro); HP CURIL: 0.00 / -146.3 deg

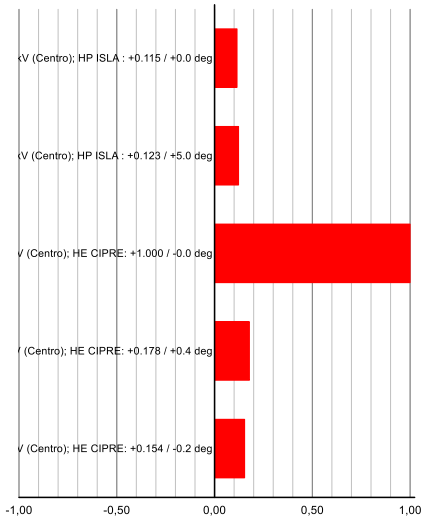


Participation of mode: -0,696 +8,543*j
Magnitude: 8,571 1/s, Angle: 94,660 deg
Period: 0,735 s, Frequency: 1,360 Hz
Damping: 0,696 1/s, Ratio of Amplitudes: 1,669

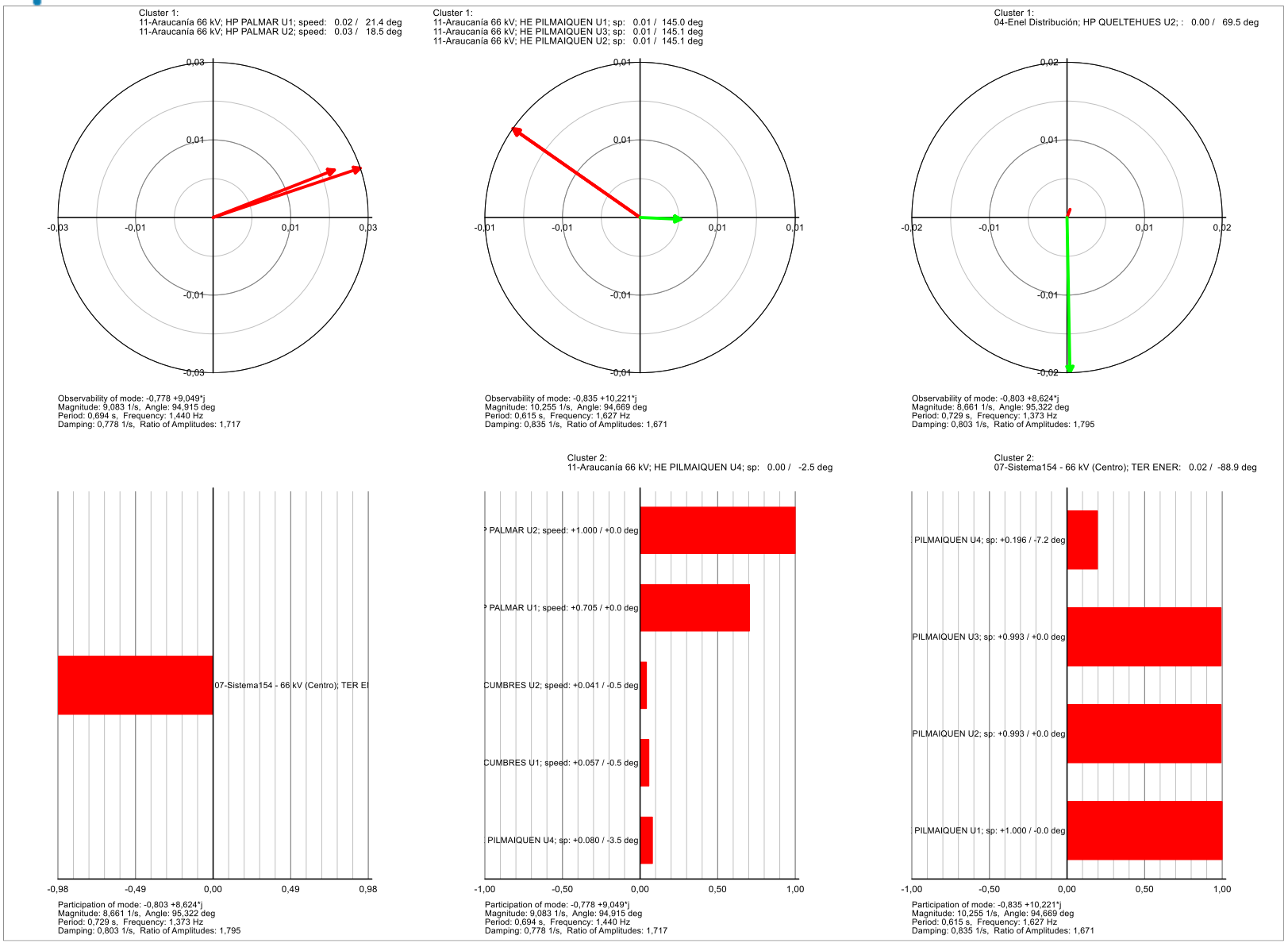
Cluster 2:
Embalse Ancoa(1); HE ANCOA U1; speed: 0.00 / -147.0 deg



Participation of mode: -0,742 +11,148*j
Magnitude: 11,172 1/s, Angle: 93,810 deg
Period: 0,564 s, Frequency: 1,774 Hz
Damping: 0,742 1/s, Ratio of Amplitudes: 1,520

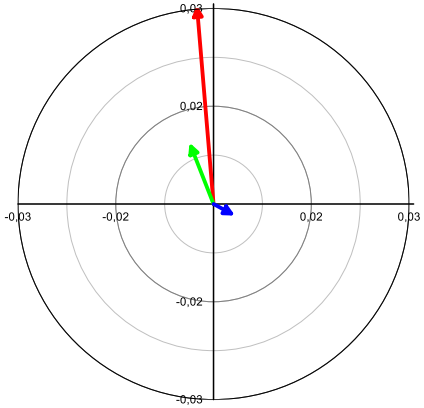


Participation of mode: -0,765 +8,107*j
Magnitude: 8,143 1/s, Angle: 95,388 deg
Period: 0,775 s, Frequency: 1,290 Hz
Damping: 0,765 1/s, Ratio of Amplitudes: 1,809


Cluster 1:
11-Araucanía 66 kV; HP PALMAR U1; speed: 0.02 / 21.4 deg
11-Araucanía 66 kV; HP PALMAR U2; speed: 0.03 / 18.5 deg
Observability of mode: -0,778 +9,049*j
Magnitude: 9,083 1/s, Angle: 94,915 deg
Period: 0,694 s, Frequency: 1,440 Hz
Damping: 0,778 1/s, Ratio of Amplitudes: 1,717
Cluster 1:
11-Araucanía 66 kV; HE PILMAIQUEN U1; sp: 0.01 / 145.0 deg
11-Araucanía 66 kV; HE PILMAIQUEN U3; sp: 0.01 / 145.1 deg
11-Araucanía 66 kV; HE PILMAIQUEN U2; sp: 0.01 / 145.1 deg
Observability of mode: -0,835 +10,221*j
Magnitude: 10,255 1/s, Angle: 94,669 deg
Period: 0,615 s, Frequency: 1,627 Hz
Damping: 0,835 1/s, Ratio of Amplitudes: 1,671
Cluster 1:
04-Enel Distribución; HP QUELTEHUES U2; : 0.00 / 69.5 deg
Observability of mode: -0,803 +8,624*j
Magnitude: 8,661 1/s, Angle: 95,322 deg
Period: 0,729 s, Frequency: 1,373 Hz
Damping: 0,803 1/s, Ratio of Amplitudes: 1,795
07-Sistema154 - 66 kV (Centro); TER EI
Participation of mode: -0,803 +8,624*j
Magnitude: 8,661 1/s, Angle: 95,322 deg
Period: 0,729 s, Frequency: 1,373 Hz
Damping: 0,803 1/s, Ratio of Amplitudes: 1,795
Cluster 2:
11-Araucanía 66 kV; HE PILMAIQUEN U4; sp: 0.00 / -2.5 deg
PALMAR U2; speed: +1.000 / +0.0 deg
PALMAR U1; speed: +0.705 / +0.0 deg
CUMBRES U2; speed: +0.041 / -0.5 deg
CUMBRES U1; speed: +0.057 / -0.5 deg
PILMAIQUEN U4; sp: +0.080 / -3.5 deg
Participation of mode: -0,778 +9,049*j
Magnitude: 9,083 1/s, Angle: 94,915 deg
Period: 0,694 s, Frequency: 1,440 Hz
Damping: 0,778 1/s, Ratio of Amplitudes: 1,717
Cluster 2:
07-Sistema154 - 66 kV (Centro); TER ENER: 0.02 / -88.9 deg
PILMAIQUEN U4; sp: +0.196 / -7.2 deg
PILMAIQUEN U3; sp: +0.993 / +0.0 deg
PILMAIQUEN U2; sp: +0.993 / +0.0 deg
PILMAIQUEN U1; sp: +1.000 / -0.0 deg
Participation of mode: -0,835 +10,221*j
Magnitude: 10,255 1/s, Angle: 94,669 deg
Period: 0,615 s, Frequency: 1,627 Hz
Damping: 0,835 1/s, Ratio of Amplitudes: 1,671

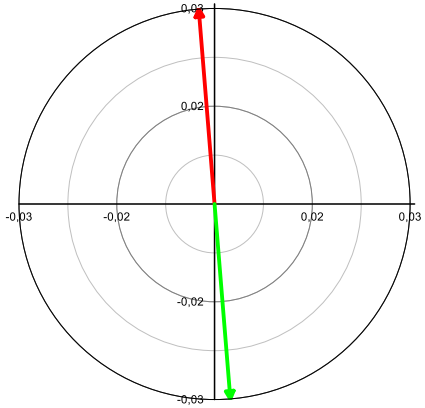
Cluster 1:
03-Chilquinta-Aconcagua; HP LOS QUILOS U: 0.03 / 94.8 deg

Cluster 2:
03-Chilquinta-Aconcagua; HP LOS QUILOS U: 0.01 / 111.4 deg



Observability of mode: -0,895 +10,706*j
Magnitude: 10,743 1/s, Angle: 94,780 deg
Period: 0,587 s, Frequency: 1,704 Hz
Damping: 0,895 1/s, Ratio of Amplitudes: 1,691

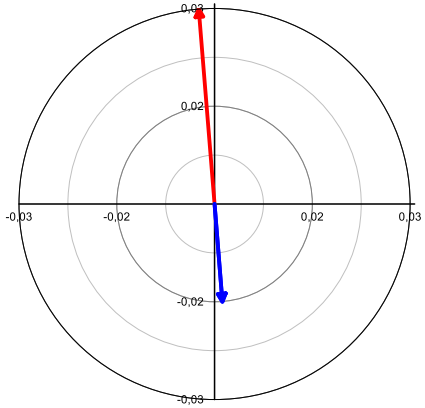
Cluster 1:
11-Araucanía 66 kV; HE PILMAIQUEN U2; sp: 0.03 / 94.6 deg



Observability of mode: -0,851 +10,489*j
Magnitude: 10,523 1/s, Angle: 94,636 deg
Period: 0,599 s, Frequency: 1,669 Hz
Damping: 0,851 1/s, Ratio of Amplitudes: 1,664

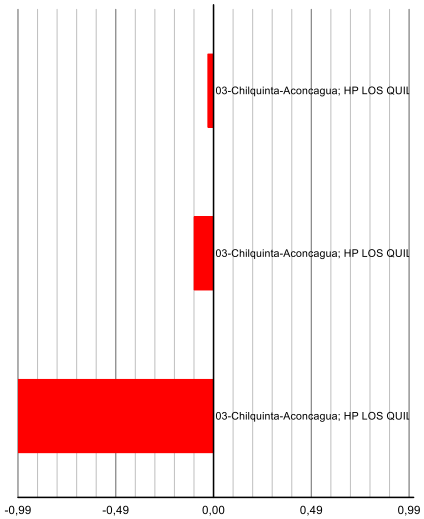
Cluster 1:
11-Araucanía 66 kV; HE PILMAIQUEN U1; sp: 0.03 / 94.6 deg

Cluster 2:
11-Araucanía 66 kV; HE PILMAIQUEN U4; sp: 0.00 / 123.5 deg



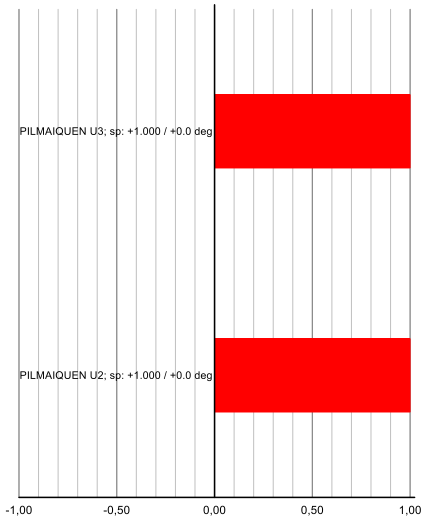
Observability of mode: -0,851 +10,488*j
Magnitude: 10,522 1/s, Angle: 94,637 deg
Period: 0,599 s, Frequency: 1,669 Hz
Damping: 0,851 1/s, Ratio of Amplitudes: 1,665

Cluster 3:
03-Chilquinta-Aconcagua; HP LOS QUILOS U: 0.00 / -28.4 deg



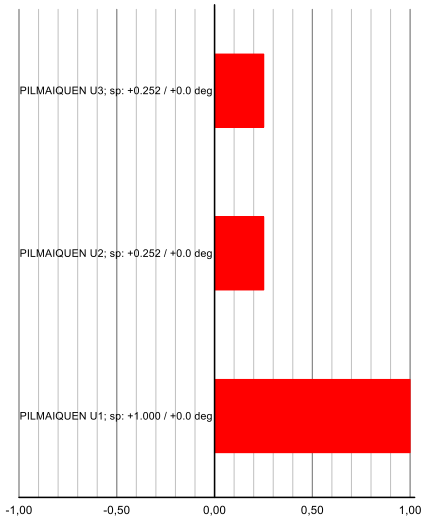
Participation of mode: -0,895 +10,706*j
Magnitude: 10,743 1/s, Angle: 94,780 deg
Period: 0,587 s, Frequency: 1,704 Hz
Damping: 0,895 1/s, Ratio of Amplitudes: 1,691

Cluster 2:
11-Araucanía 66 kV; HE PILMAIQUEN U3; sp: 0.03 / -85.4 deg



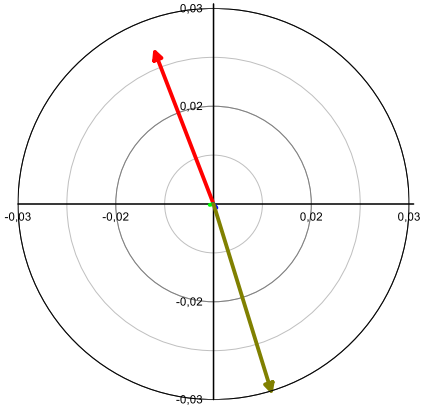
Participation of mode: -0,851 +10,489*j
Magnitude: 10,523 1/s, Angle: 94,636 deg
Period: 0,599 s, Frequency: 1,669 Hz
Damping: 0,851 1/s, Ratio of Amplitudes: 1,664

Cluster 3:
11-Araucanía 66 kV; HE PILMAIQUEN U3; sp: 0.02 / -85.4 deg
11-Araucanía 66 kV; HE PILMAIQUEN U2; sp: 0.02 / -85.4 deg



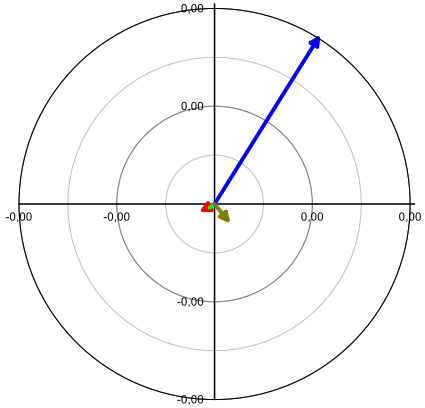
Participation of mode: -0,851 +10,488*j
Magnitude: 10,522 1/s, Angle: 94,637 deg
Period: 0,599 s, Frequency: 1,669 Hz
Damping: 0,851 1/s, Ratio of Amplitudes: 1,665

Cluster 1:
11-Araucanía 66 kV; HP PALMAR U2; speed: 0.03 / 111.1 deg



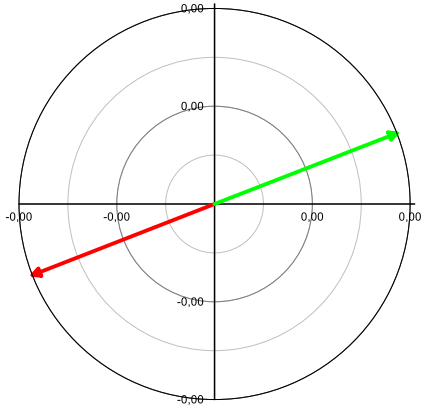
Observability of mode: -0,973 +9,792*j
Magnitude: 9,840 1/s, Angle: 95,677 deg
Period: 0,642 s, Frequency: 1,558 Hz
Damping: 0,973 1/s,

Cluster 3:
08-Charrúa; HP PALMUCHO U1; speed: 0.00 / 58.0 deg



Observability of mode: -0,977 +12,194*j
Magnitude: 12,233 1/s, Angle: 94,579 deg
Period: 0,515 s, Frequency: 1,941 Hz

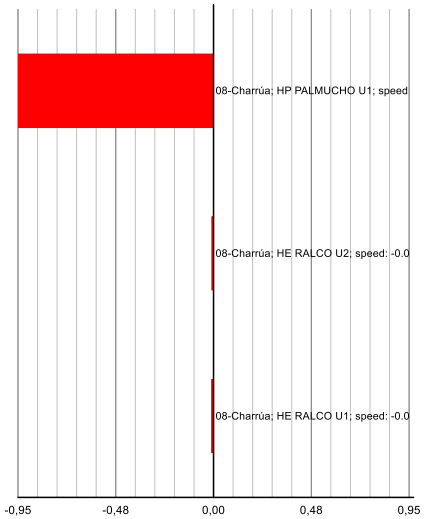
Cluster 2:
10-Araucanía; HE CANUTILLAR U1; speed: 0.00 / 21.2 deg



Observability of mode: -0,905 +11,267*j
Magnitude: 11,303 1/s, Angle: 94,595 deg
Period: 0,558 s, Frequency: 1,793 Hz
Damping: 0,905 1/s, Ratio of Amplitudes: 1,657

Cluster 3:
11-Araucanía 66 kV; HE PILMAIQUEN U4; sp: 0.00 / -52.3 deg

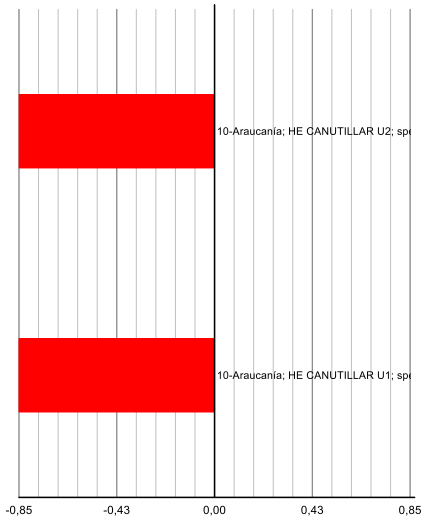
Cluster 2:
10-Araucanía; HP CARILAFQUEN U1; speed: 0.00 / -167.0 deg J1; speed: 0.03 / -72.9 deg



Participation of mode: -0,977 +12,194*j
Magnitude: 12,233 1/s, Angle: 94,579 deg
Period: 0,515 s, Frequency: 1,941 Hz
Damping: 0,977 1/s, Ratio of Amplitudes: 1,654

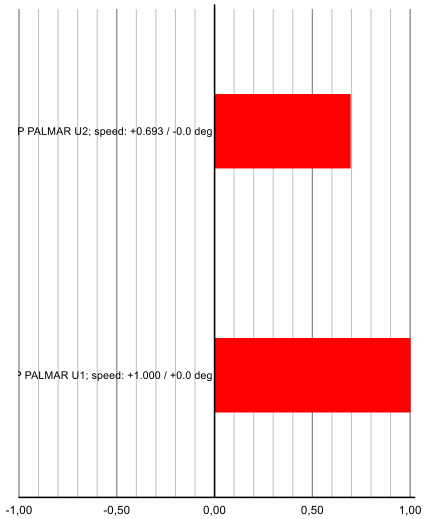
Cluster 1:
07-Sistema154 - 66 kV (Centro); TER LICA: 0.00 / -152.4 deg

Cluster 2:
06-Troncal_Qui-Cha; HP LOS HIERROS U1; s: 0.00 / -144.1 deg A GORDA E: 0.00 / -50.9 deg



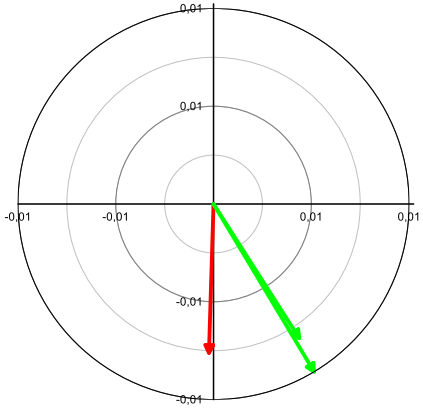
Participation of mode: -0,905 +11,267*j
Magnitude: 11,303 1/s, Angle: 94,595 deg
Period: 0,558 s, Frequency: 1,793 Hz
Damping: 0,905 1/s, Ratio of Amplitudes: 1,657

Cluster 1:
10-Araucanía; HE CANUTILLAR U2; speed: 0.00 / -158.7 deg

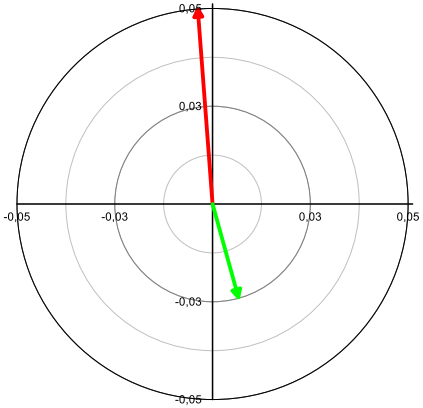


Participation of mode: -0,973 +9,792*j
Magnitude: 9,840 1/s, Angle: 95,677 deg
Period: 0,642 s, Frequency: 1,558 Hz
Damping: 0,973 1/s, Ratio of Amplitudes: 1,867

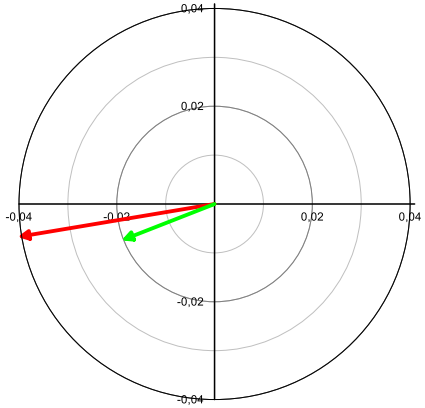
Cluster 1:
07-Sistema154 - 66 kV (Centro); HE CONVE: 0.05 / 94.3 deg



Observability of mode: -1,036 +10,620*j
Magnitude: 10,670 1/s, Angle: 95,571 deg
Period: 0,592 s, Frequency: 1,690 Hz
Damping: 1,036 1/s, Ratio of Amplitudes: 1,846



Observability of mode: -1,200 +15,886*j
Magnitude: 15,931 1/s, Angle: 94,321 deg
Period: 0,396 s, Frequency: 2,528 Hz
Damping: 1,200 1/s, Ratio of Amplitudes: 1,608



Observability of mode: -1,158 +14,343*j
Magnitude: 14,390 1/s, Angle: 94,618 deg
Period: 0,438 s, Frequency: 2,283 Hz

Cluster 1:
07-Sistema154 - 66 kV (Centro); HE CONVE: 0.04 / -170.5 deg

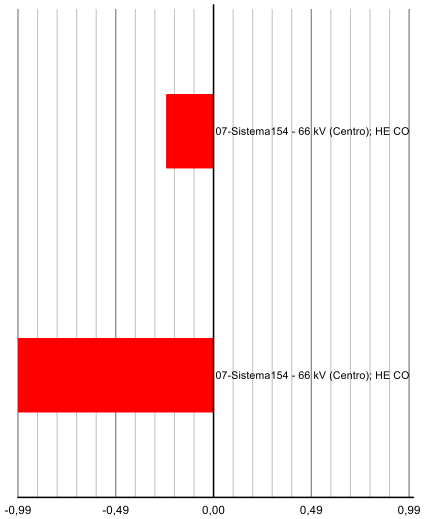
Cluster 2:
07-Sistema154 - 66 kV (Centro); HE CONVE: 0.02 / -158.6 deg

Cluster 2:

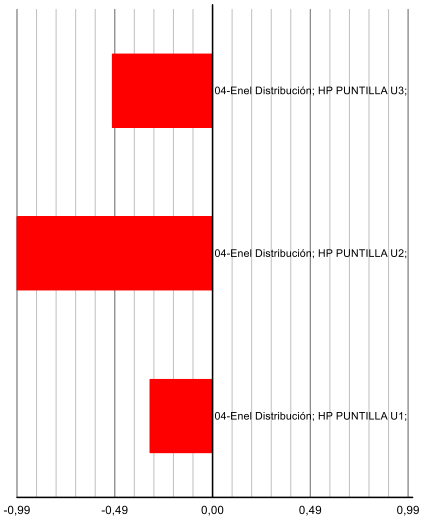
Cluster 1:
04-Enel Distribución; HP PUNTILLA U3; sp: 0.01 / -91.8 deg

I1; sp: 0.01 / -57.4 deg
I2; sp: 0.01 / -59.1 deg

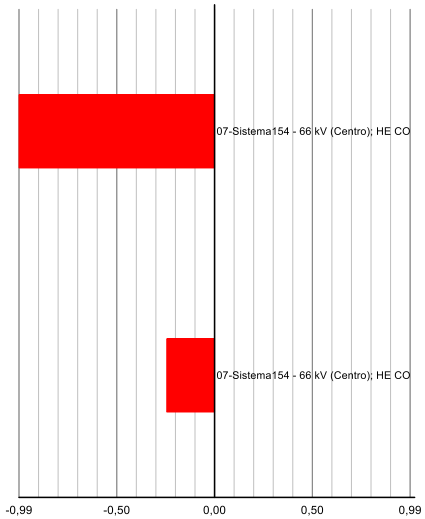
Cluster 2:
07-Sistema154 - 66 kV (Centro); HE CONVE: 0.03 / -74.5 deg



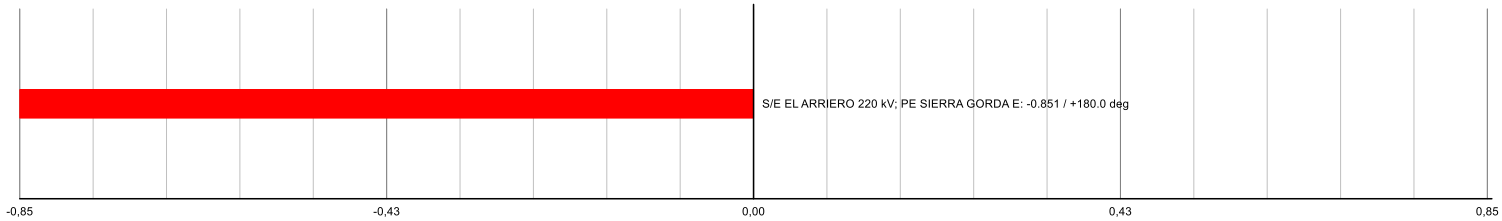
Participation of mode: -1,158 +14,343*j
Magnitude: 14,390 1/s, Angle: 94,618 deg
Period: 0,438 s, Frequency: 2,283 Hz
Damping: 1,158 1/s, Ratio of Amplitudes: 1,661



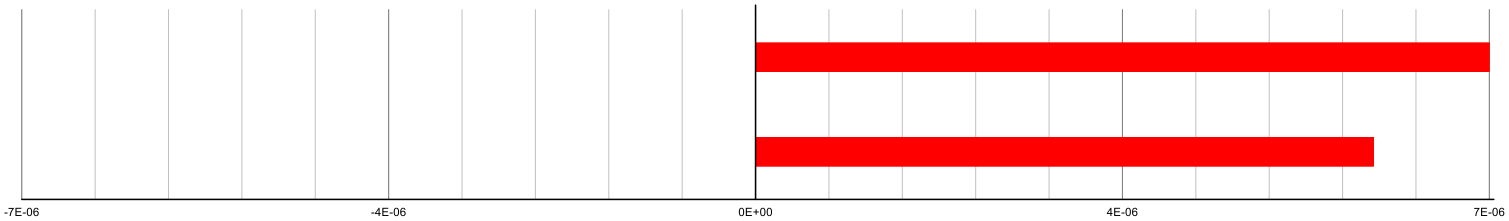
Participation of mode: -1,036 +10,620*j
Magnitude: 10,670 1/s, Angle: 95,571 deg
Period: 0,592 s, Frequency: 1,690 Hz
Damping: 1,036 1/s, Ratio of Amplitudes: 1,846



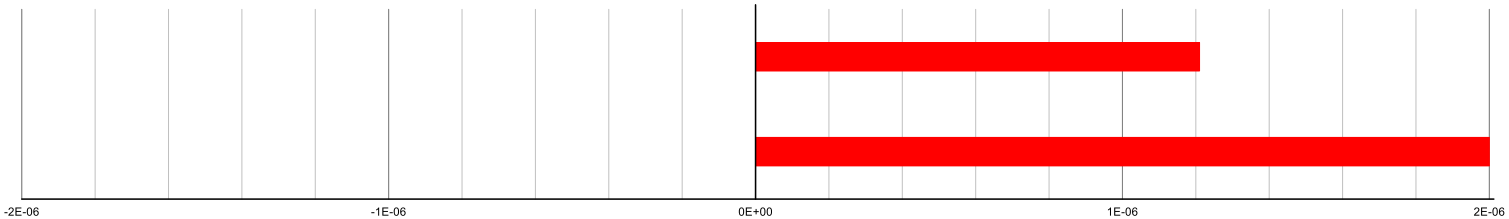
Participation of mode: -1,200 +15,886*j
Magnitude: 15,931 1/s, Angle: 94,321 deg
Period: 0,396 s, Frequency: 2,528 Hz
Damping: 1,200 1/s, Ratio of Amplitudes: 1,608



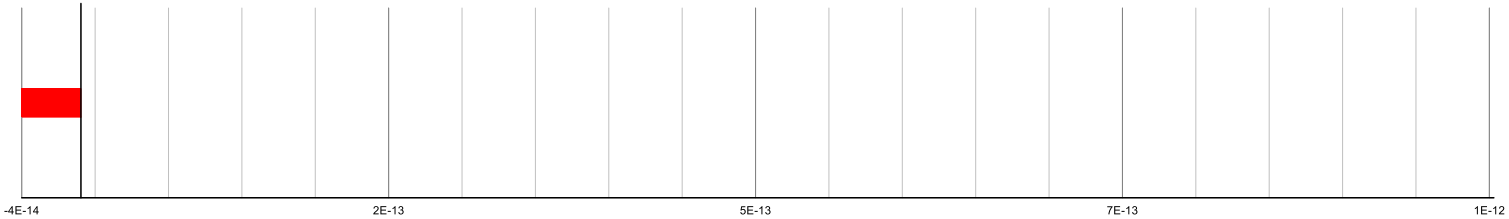
Participation of mode: -0,604 +9,779*j
Magnitude: 9,798 1/s, Angle: 93,535 deg
Period: 0,643 s, Frequency: 1,556 Hz
Damping: 0,604 1/s, Ratio of Amplitudes: 1,474



Participation of mode: -0,897 +9,897*j
Magnitude: 9,937 1/s, Angle: 95,180 deg
Period: 0,635 s, Frequency: 1,575 Hz
Damping: 0,897 1/s, Ratio of Amplitudes: 1,768

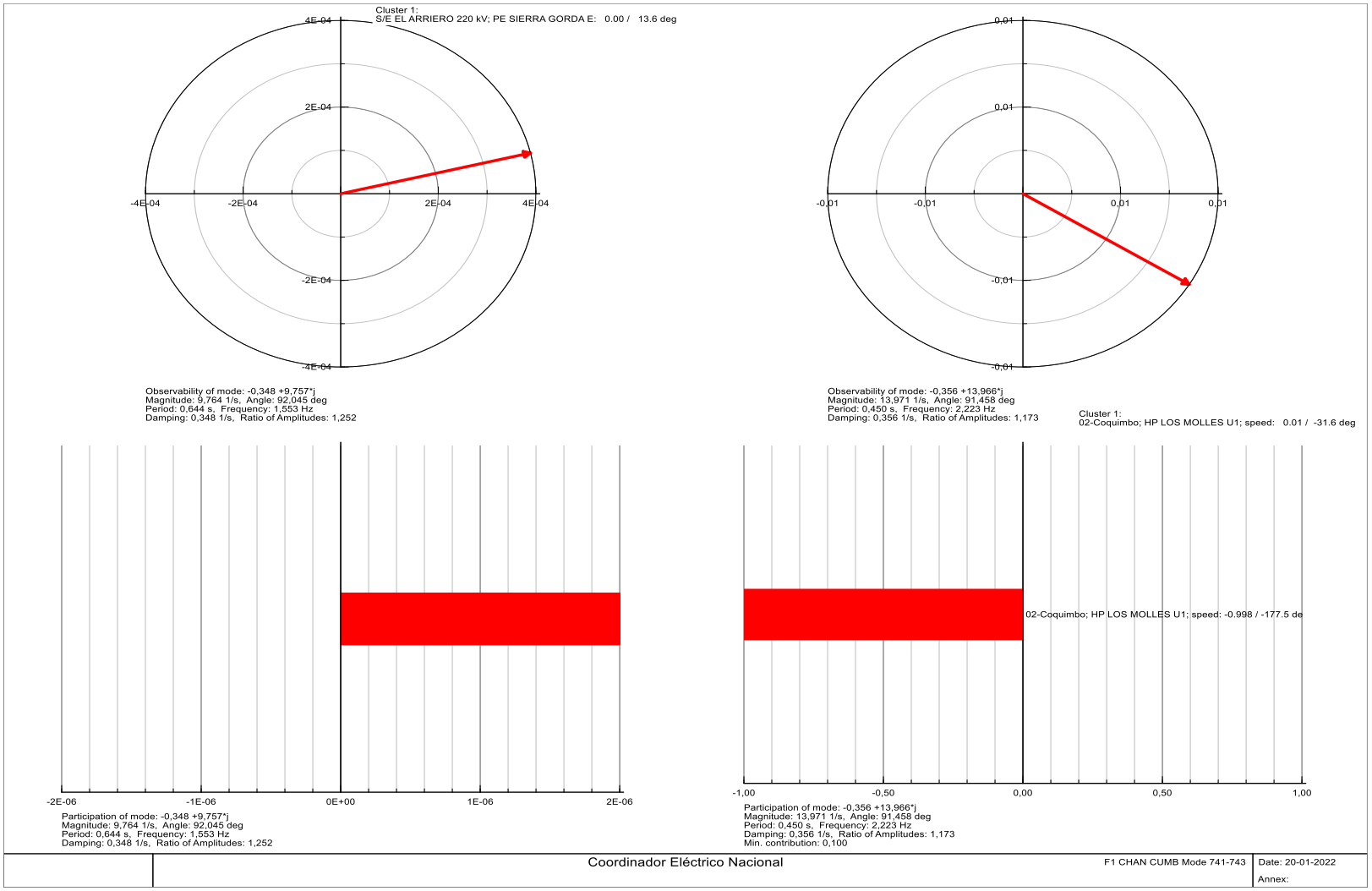


Participation of mode: -0,348 +9,757*j
Magnitude: 9,764 1/s, Angle: 92,045 deg
Period: 0,644 s, Frequency: 1,553 Hz
Damping: 0,348 1/s, Ratio of Amplitudes: 1,252

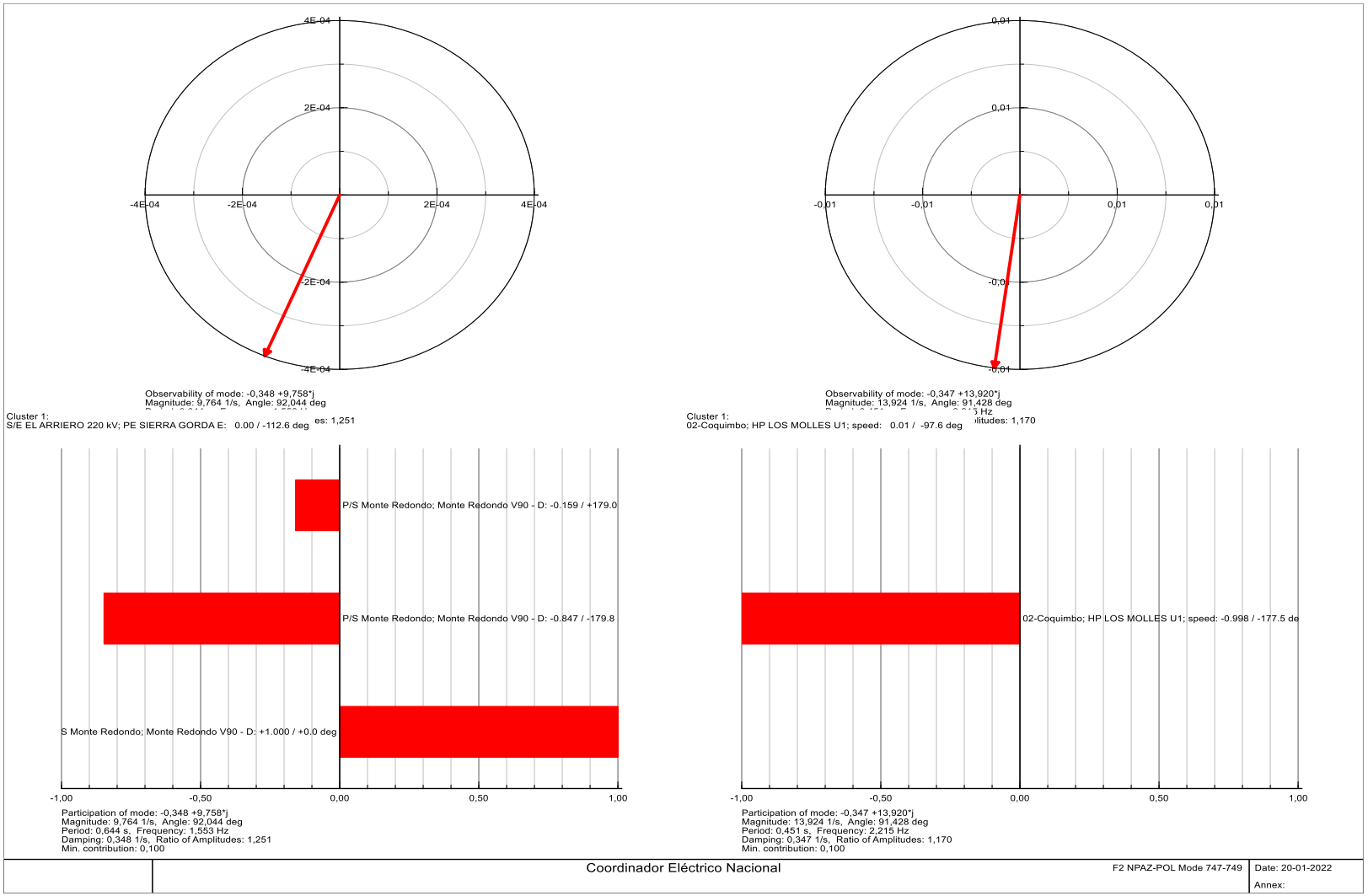


Participation of mode: -0,889 +9,904*j
Magnitude: 9,944 1/s, Angle: 95,129 deg
Period: 0,634 s, Frequency: 1,576 Hz
Damping: 0,889 1/s, Ratio of Amplitudes: 1,758

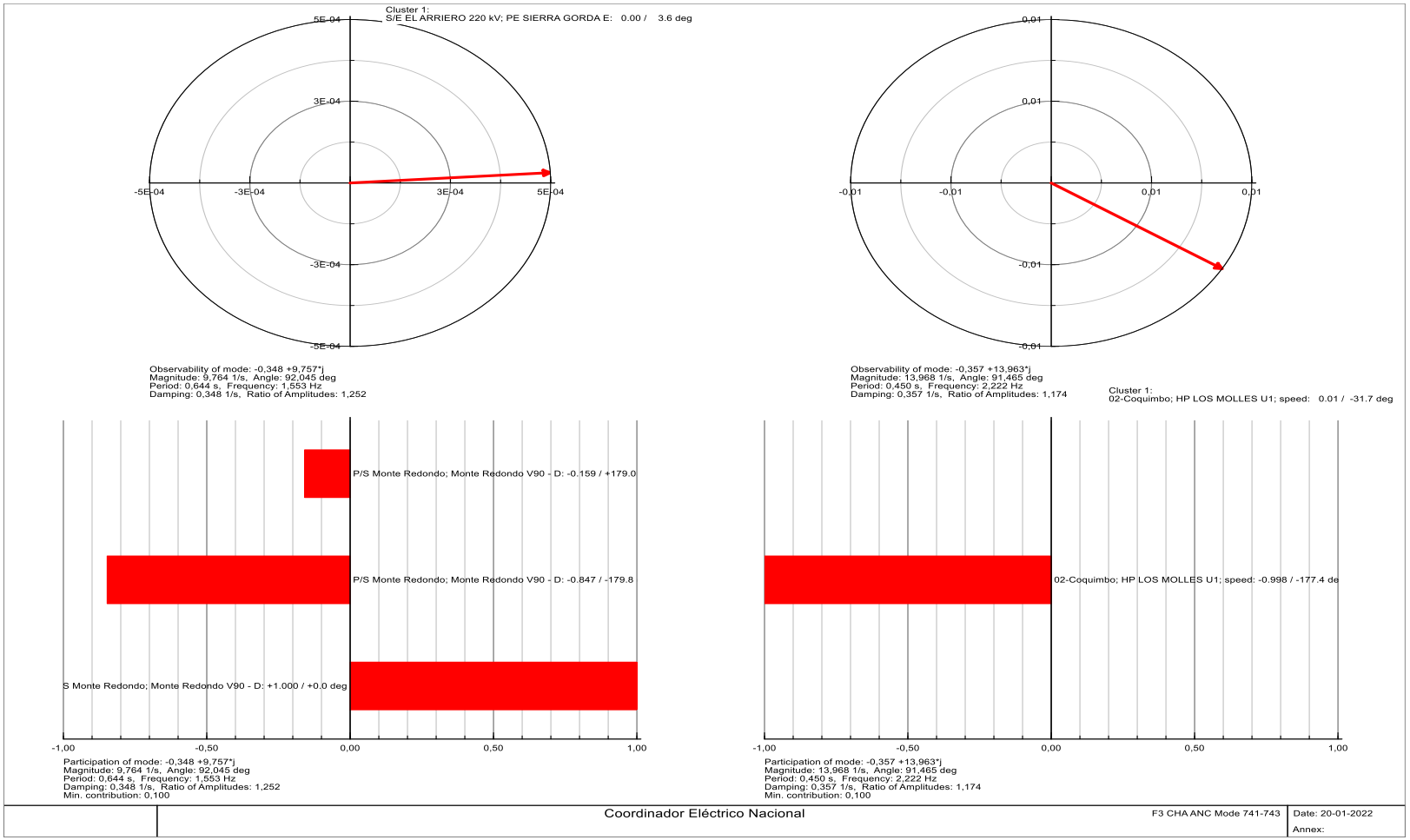
14.1.2 Red N-1 Caso 1.- Changos Cumbres 500 kV



14.1.3 Red N-1 Caso 2.- Nueva Pan de Azúcar - Polpaico 500kV

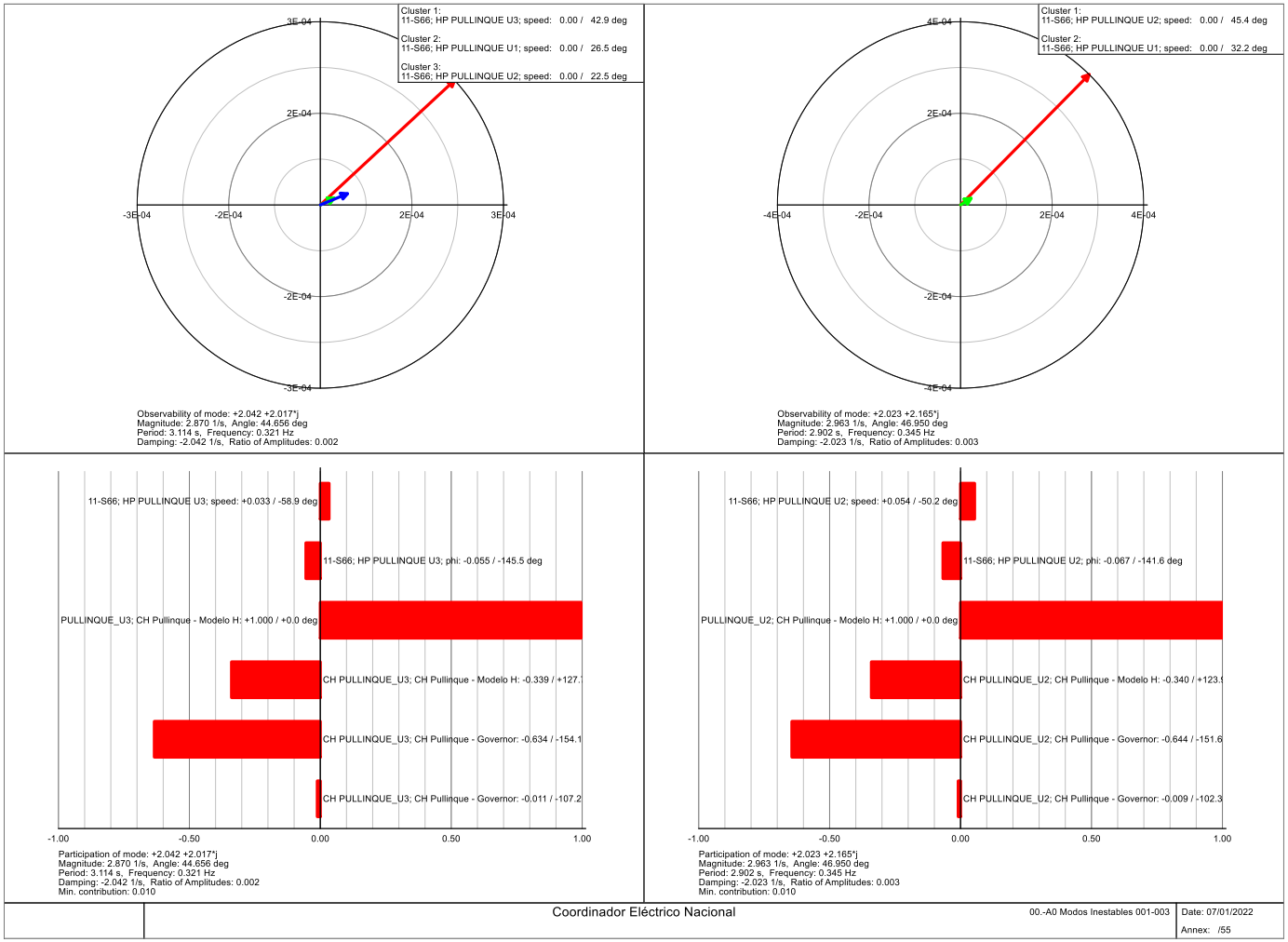


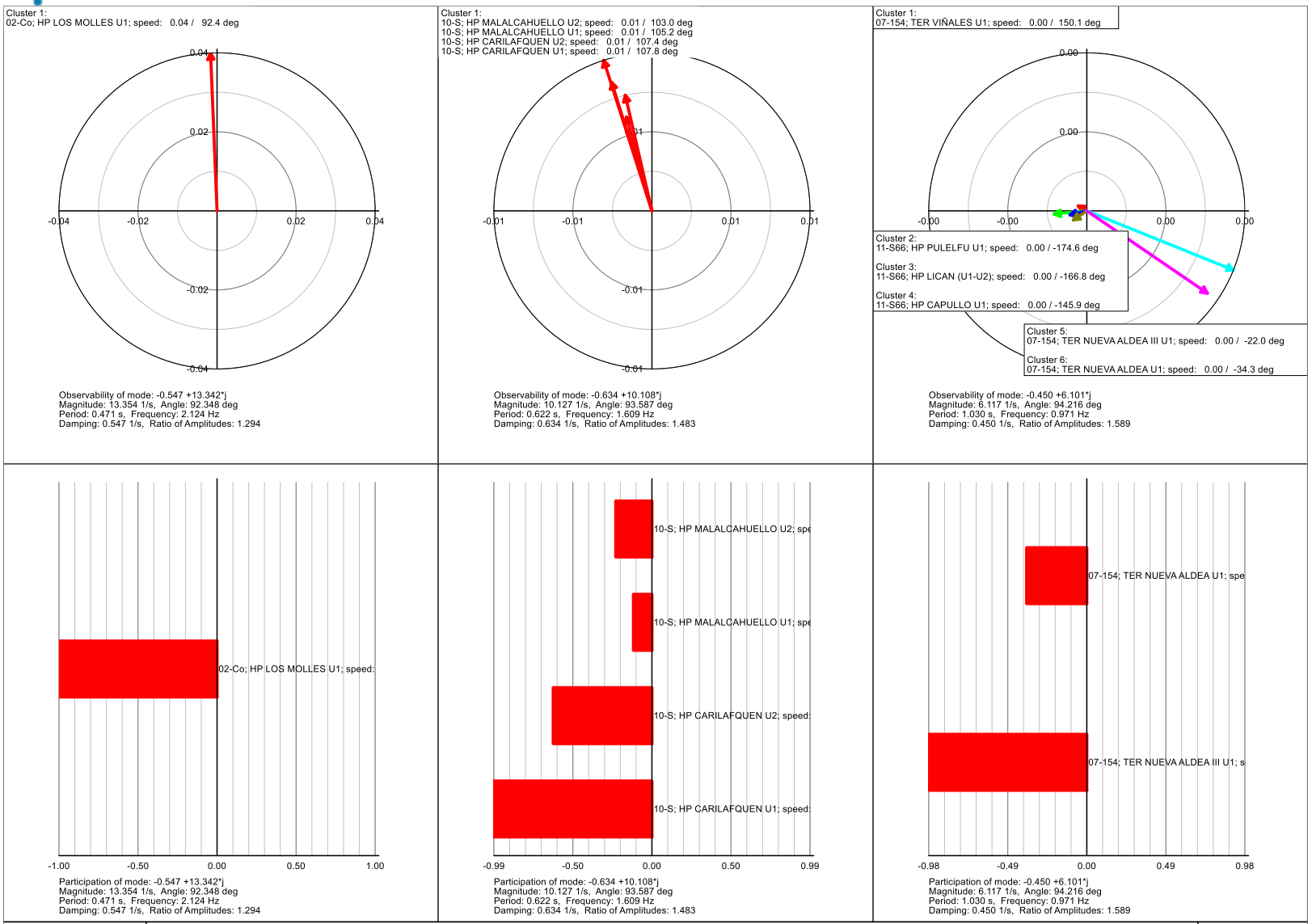
14.1.4 Red N-1 Caso 3.- Charrúa - Ancoa 500kV



14.2 Escenario E2 DA día Dic2022

14.2.1 Red N



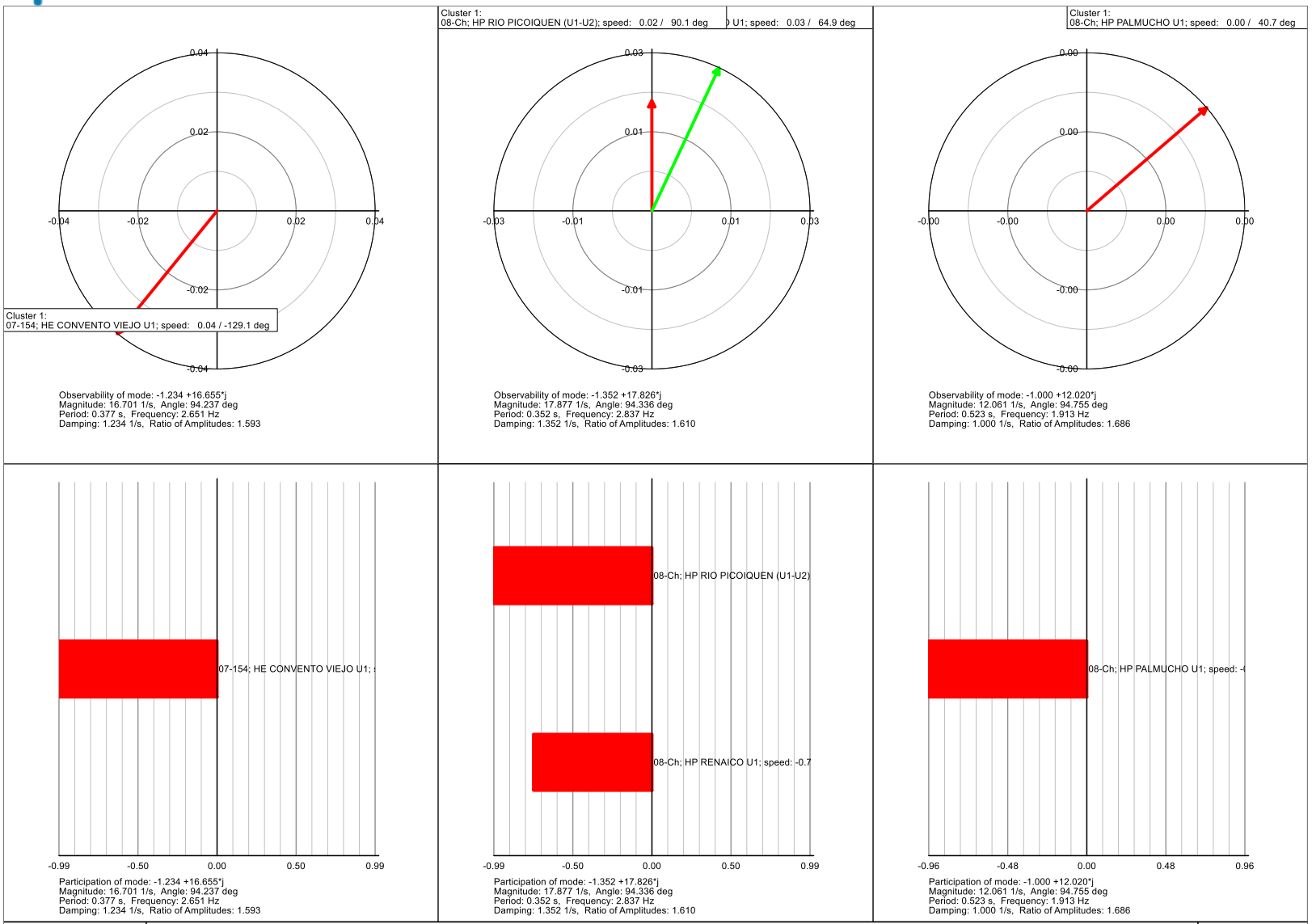


Coordinador Eléctrico Nacional

01.- A Modos 1127-1152-0990

Date: 07/01/2022

Annex: /61

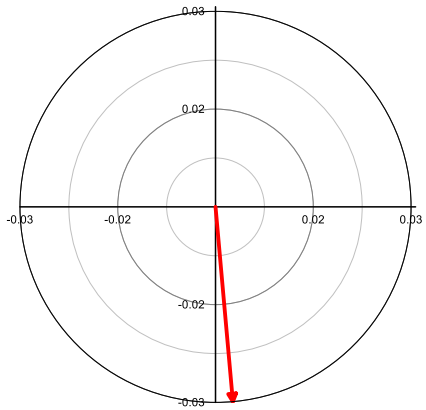


Coordinador Eléctrico Nacional

02.- A Modos 1474-1513-1283

Date: 07/01/2022

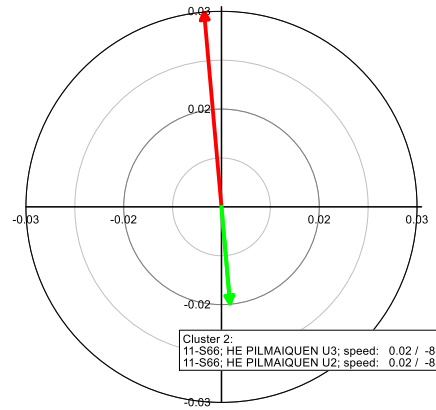
Annex: /62



Observability of mode: -0.917 +10.274*j
Magnitude: 10.315 1/s, Angle: 95.098 deg
Period: 0.612 s, Frequency: 1.635 Hz
Damping: 0.917 1/s, Ratio of Amplitudes: 1.752

Cluster 1:
11-S66; HE PILMAIQUEN U3; speed: 0.03 / -84.9 deg

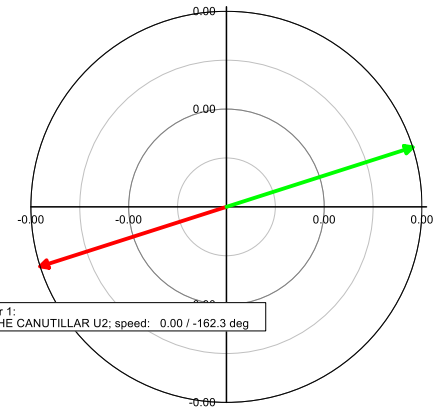
Cluster 1:
11-S66; HE PILMAIQUEN U1; speed: 0.03 / 95.1 deg



Cluster 2:
11-S66; HE PILMAIQUEN U3; speed: 0.02 / -85.0 deg
11-S66; HE PILMAIQUEN U2; speed: 0.02 / -85.0 deg

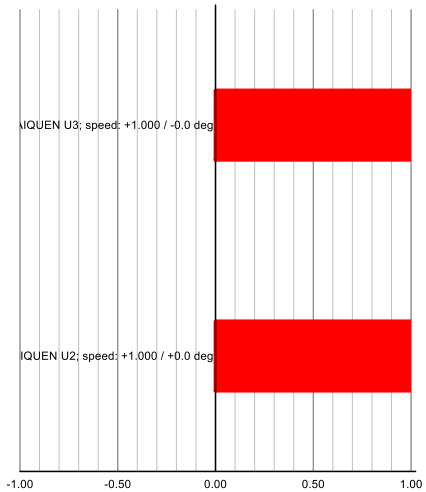
Observability of mode: -0.917 +10.275*j
Magnitude: 10.316 1/s, Angle: 95.098 deg
Period: 0.612 s, Frequency: 1.635 Hz
Damping: 0.917 1/s, Ratio of Amplitudes: 1.752

Cluster 2:
10-S; HE CANUTILLAR U1; speed: 0.00 / 17.7 deg

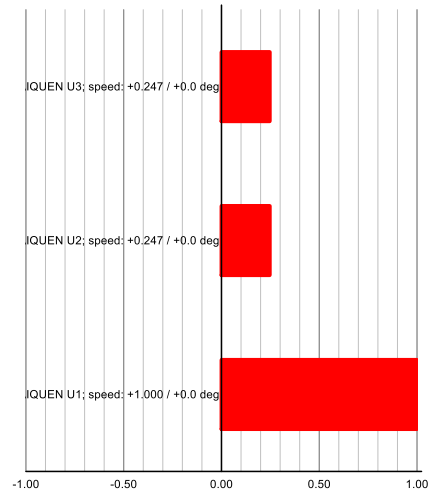


Cluster 1:
10-S; HE CANUTILLAR U2; speed: 0.00 / -162.3 deg

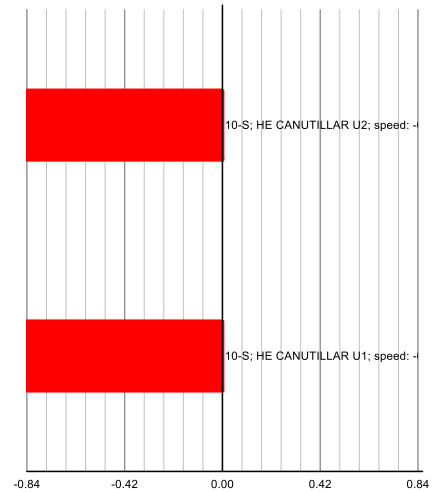
Observability of mode: -1.001 +11.090*j
Magnitude: 11.135 1/s, Angle: 95.156 deg
Period: 0.567 s, Frequency: 1.765 Hz
Damping: 1.001 1/s, Ratio of Amplitudes: 1.763



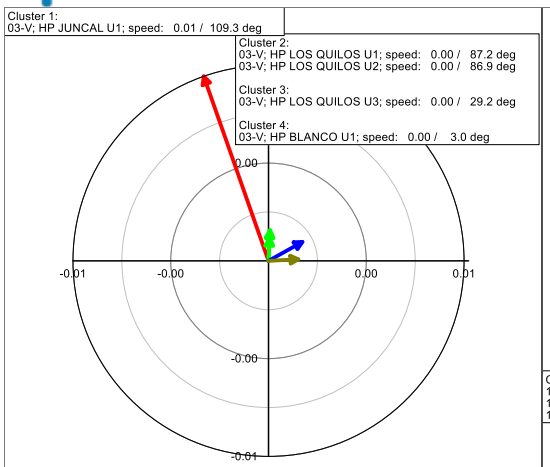
Participation of mode: -0.917 +10.274*j
Magnitude: 10.315 1/s, Angle: 95.098 deg
Period: 0.612 s, Frequency: 1.635 Hz
Damping: 0.917 1/s, Ratio of Amplitudes: 1.752



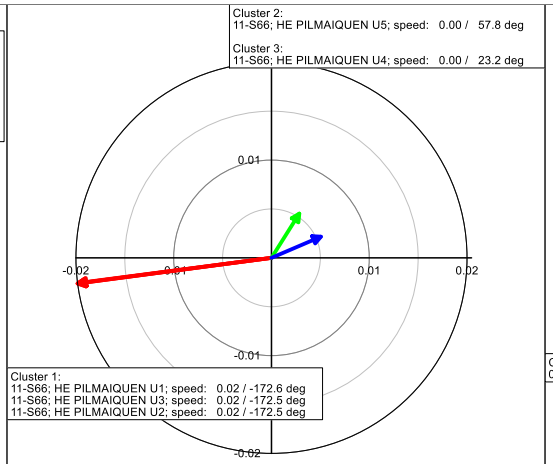
Participation of mode: -0.917 +10.275*j
Magnitude: 10.316 1/s, Angle: 95.098 deg
Period: 0.612 s, Frequency: 1.635 Hz
Damping: 0.917 1/s, Ratio of Amplitudes: 1.752



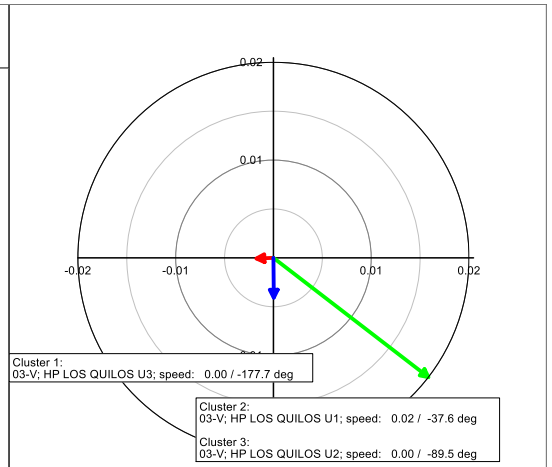
Participation of mode: -1.001 +11.090*j
Magnitude: 11.135 1/s, Angle: 95.156 deg
Period: 0.567 s, Frequency: 1.765 Hz
Damping: 1.001 1/s, Ratio of Amplitudes: 1.763



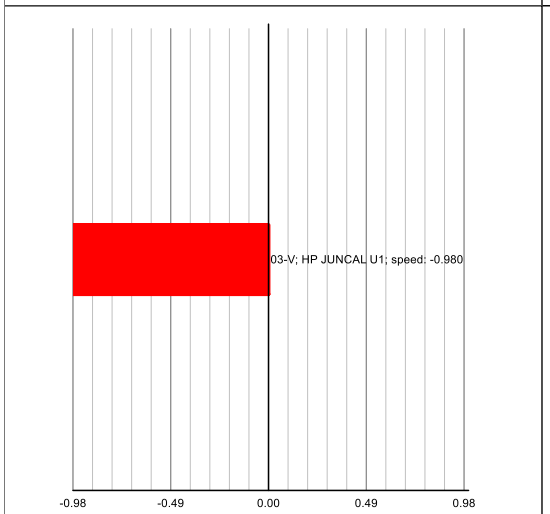
Observability of mode: -0.837 +9.087*j
Magnitude: 9.126 1/s, Angle: 95.264 deg
Period: 0.691 s, Frequency: 1.446 Hz
Damping: 0.837 1/s, Ratio of Amplitudes: 1.784



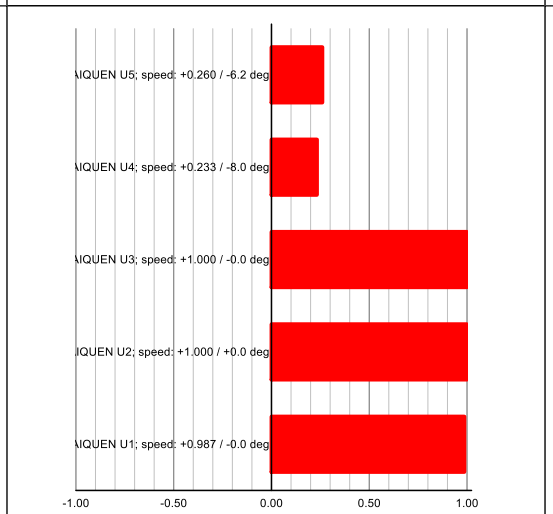
Observability of mode: -0.950 +10.115*j
Magnitude: 10.160 1/s, Angle: 95.364 deg
Period: 0.621 s, Frequency: 1.610 Hz
Damping: 0.950 1/s, Ratio of Amplitudes: 1.804



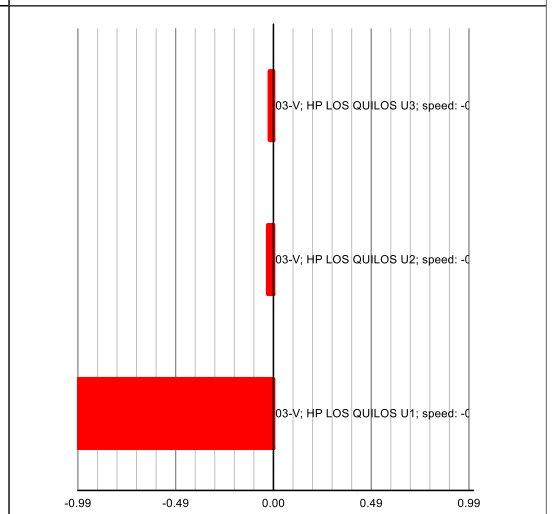
Observability of mode: -1.032 +10.961*j
Magnitude: 11.010 1/s, Angle: 95.380 deg
Period: 0.573 s, Frequency: 1.745 Hz
Damping: 1.032 1/s, Ratio of Amplitudes: 1.807



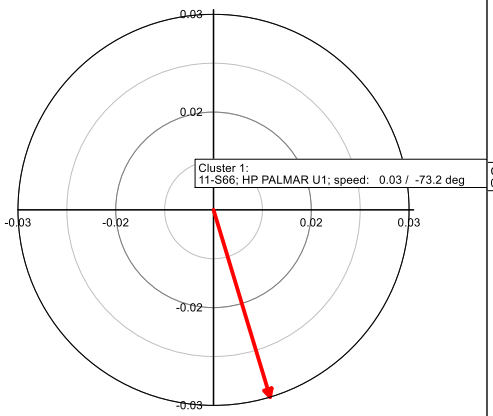
Participation of mode: -0.837 +9.087*j
Magnitude: 9.126 1/s, Angle: 95.264 deg
Period: 0.691 s, Frequency: 1.446 Hz
Damping: 0.837 1/s, Ratio of Amplitudes: 1.784



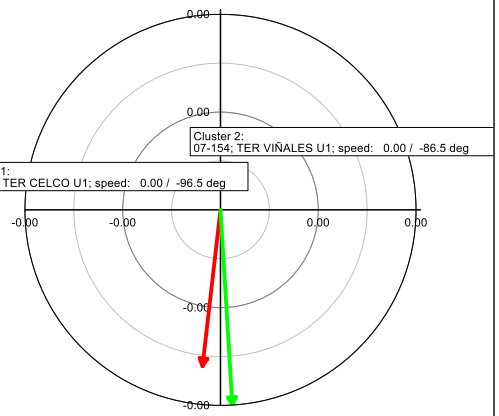
Participation of mode: -0.950 +10.115*j
Magnitude: 10.160 1/s, Angle: 95.364 deg
Period: 0.621 s, Frequency: 1.610 Hz
Damping: 0.950 1/s, Ratio of Amplitudes: 1.804



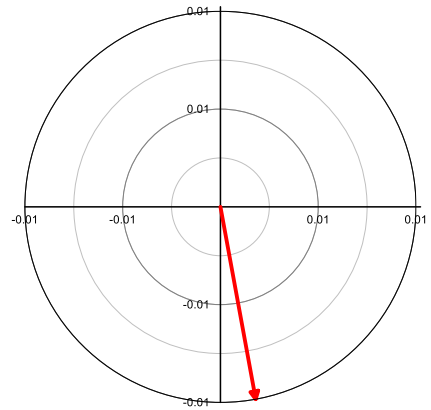
Participation of mode: -1.032 +10.961*j
Magnitude: 11.010 1/s, Angle: 95.380 deg
Period: 0.573 s, Frequency: 1.745 Hz
Damping: 1.032 1/s, Ratio of Amplitudes: 1.807



Observability of mode: -0.891 +9.433*j
Magnitude: 9.475 1/s, Angle: 95.399 deg
Period: 0.666 s, Frequency: 1.501 Hz
Damping: 0.891 1/s, Ratio of Amplitudes: 1.811

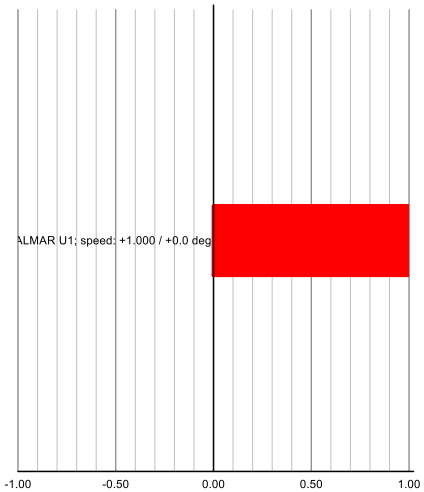


Observability of mode: -0.461 +4.866*j
Magnitude: 4.887 1/s, Angle: 95.416 deg
Period: 1.291 s, Frequency: 0.774 Hz
Damping: 0.461 1/s, Ratio of Amplitudes: 1.814

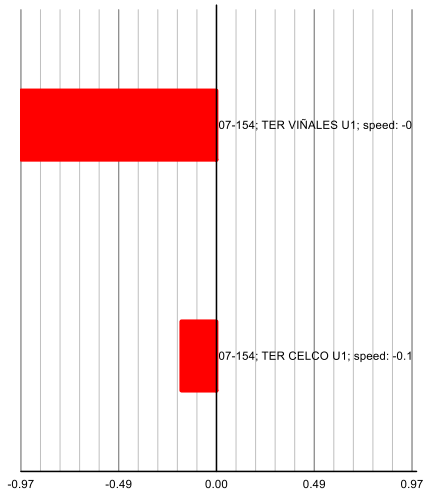


Observability of mode: -0.829 +8.644*j
Magnitude: 8.684 1/s, Angle: 95.479 deg
Period: 0.727 s, Frequency: 1.376 Hz
Damping: 0.829 1/s, Ratio of Amplitudes: 1.827

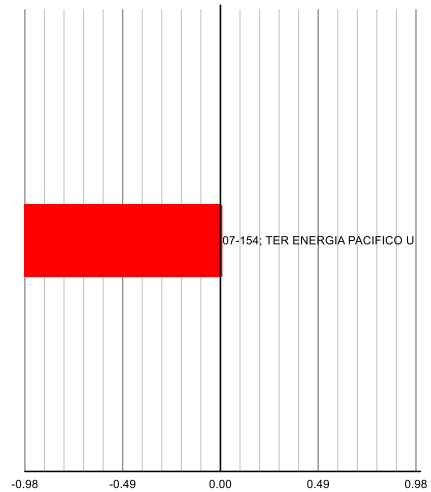
Cluster 1:
07-154; TER ENERGIA PACIFICO U1; speed: 0.01 / -79.6 deg



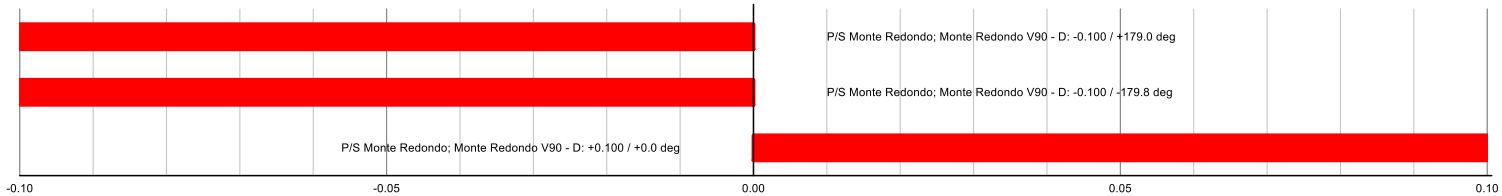
Participation of mode: -0.891 +9.433*j
Magnitude: 9.475 1/s, Angle: 95.399 deg
Period: 0.666 s, Frequency: 1.501 Hz
Damping: 0.891 1/s, Ratio of Amplitudes: 1.811



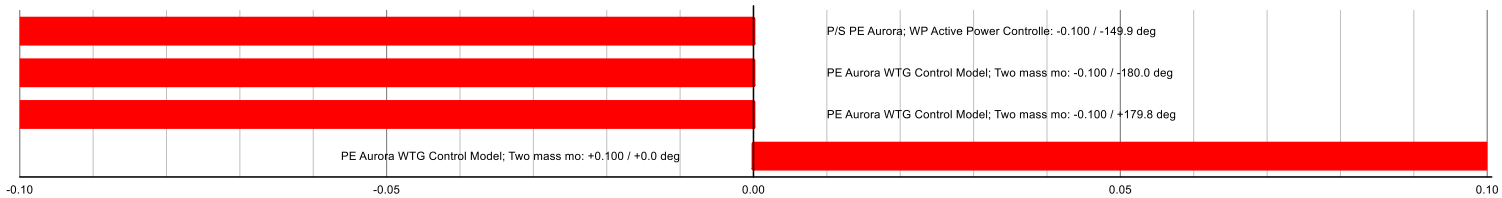
Participation of mode: -0.461 +4.866*j
Magnitude: 4.887 1/s, Angle: 95.416 deg
Period: 1.291 s, Frequency: 0.774 Hz
Damping: 0.461 1/s, Ratio of Amplitudes: 1.814



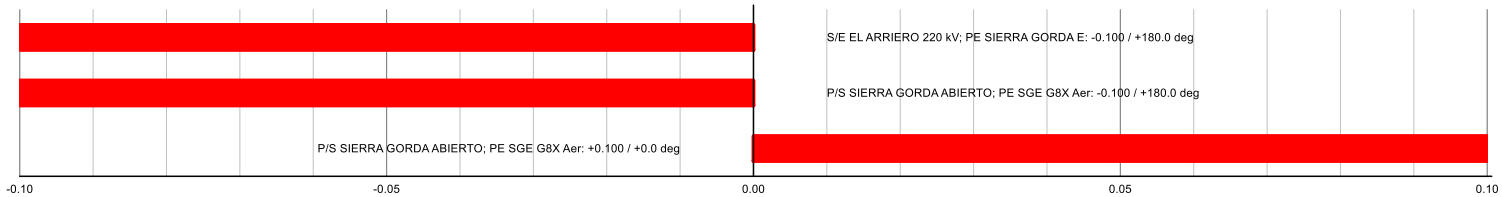
Participation of mode: -0.829 +8.644*j
Magnitude: 8.684 1/s, Angle: 95.479 deg
Period: 0.727 s, Frequency: 1.376 Hz
Damping: 0.829 1/s, Ratio of Amplitudes: 1.827



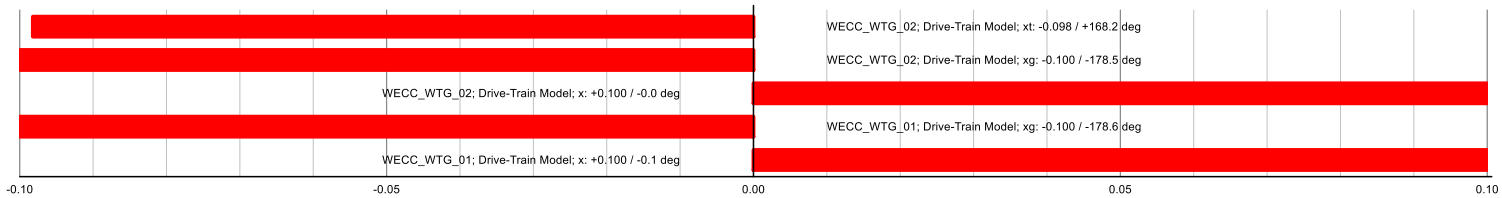
Participation of mode: -0.349 +9.757*j
Magnitude: 9.763 1/s, Angle: 92.046 deg
Period: 0.644 s, Frequency: 1.553 Hz
Damping: 0.349 1/s, Ratio of Amplitudes: 1.252
Min. contribution: 0.100



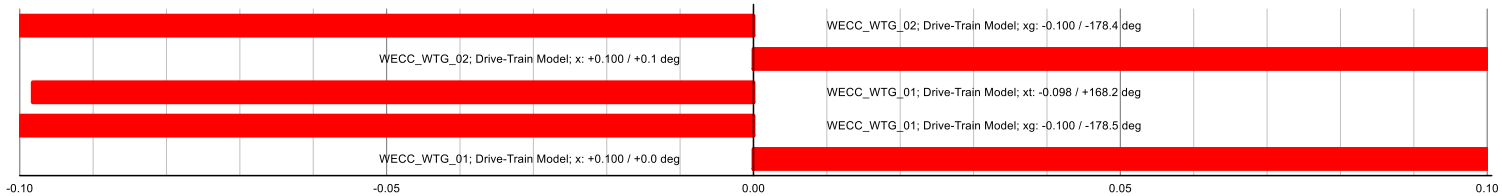
Participation of mode: -0.358 +8.313*j
Magnitude: 8.321 1/s, Angle: 92.466 deg
Period: 0.756 s, Frequency: 1.323 Hz
Damping: 0.358 1/s, Ratio of Amplitudes: 1.311
Min. contribution: 0.100



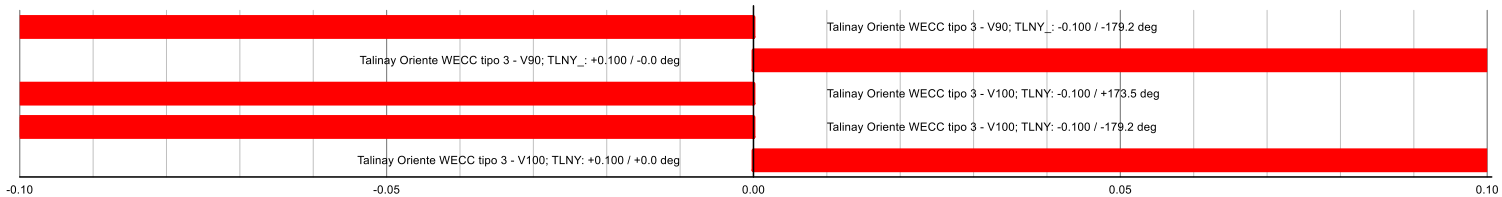
Participation of mode: -0.602 +9.775*j
Magnitude: 9.794 1/s, Angle: 93.526 deg
Period: 0.643 s, Frequency: 1.556 Hz
Damping: 0.602 1/s, Ratio of Amplitudes: 1.473
Min. contribution: 0.100



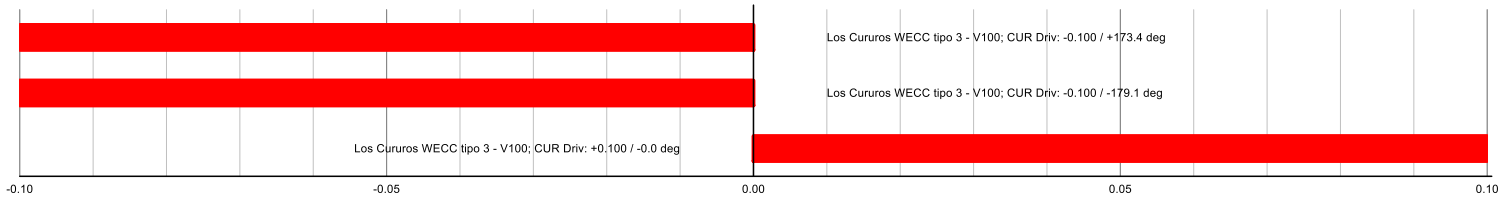
Participation of mode: -0.911 +9.913*j
Magnitude: 9.955 1/s, Angle: 95.250 deg
Period: 0.634 s, Frequency: 1.578 Hz
Damping: 0.911 1/s, Ratio of Amplitudes: 1.781
Min. contribution: 0.100



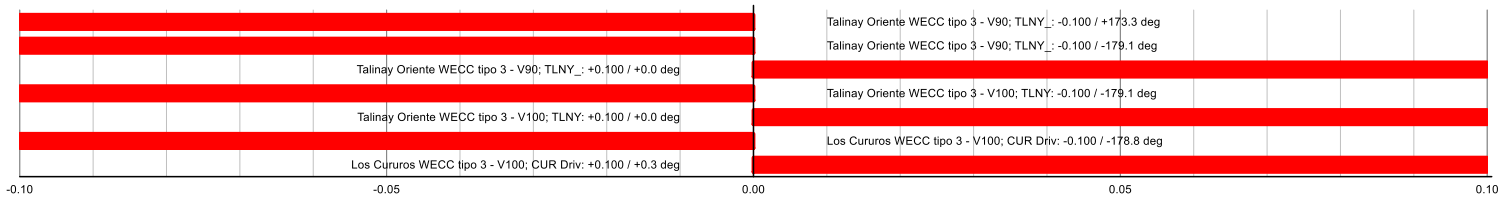
Participation of mode: -0.911 +9.912*j
Magnitude: 9.954 1/s, Angle: 95.253 deg
Period: 0.634 s, Frequency: 1.578 Hz
Damping: 0.911 1/s, Ratio of Amplitudes: 1.782
Min. contribution: 0.100



Participation of mode: -1.136 +12.255*j
Magnitude: 12.307 1/s, Angle: 95.296 deg
Period: 0.513 s, Frequency: 1.950 Hz
Damping: 1.136 1/s, Ratio of Amplitudes: 1.790
Min. contribution: 0.100

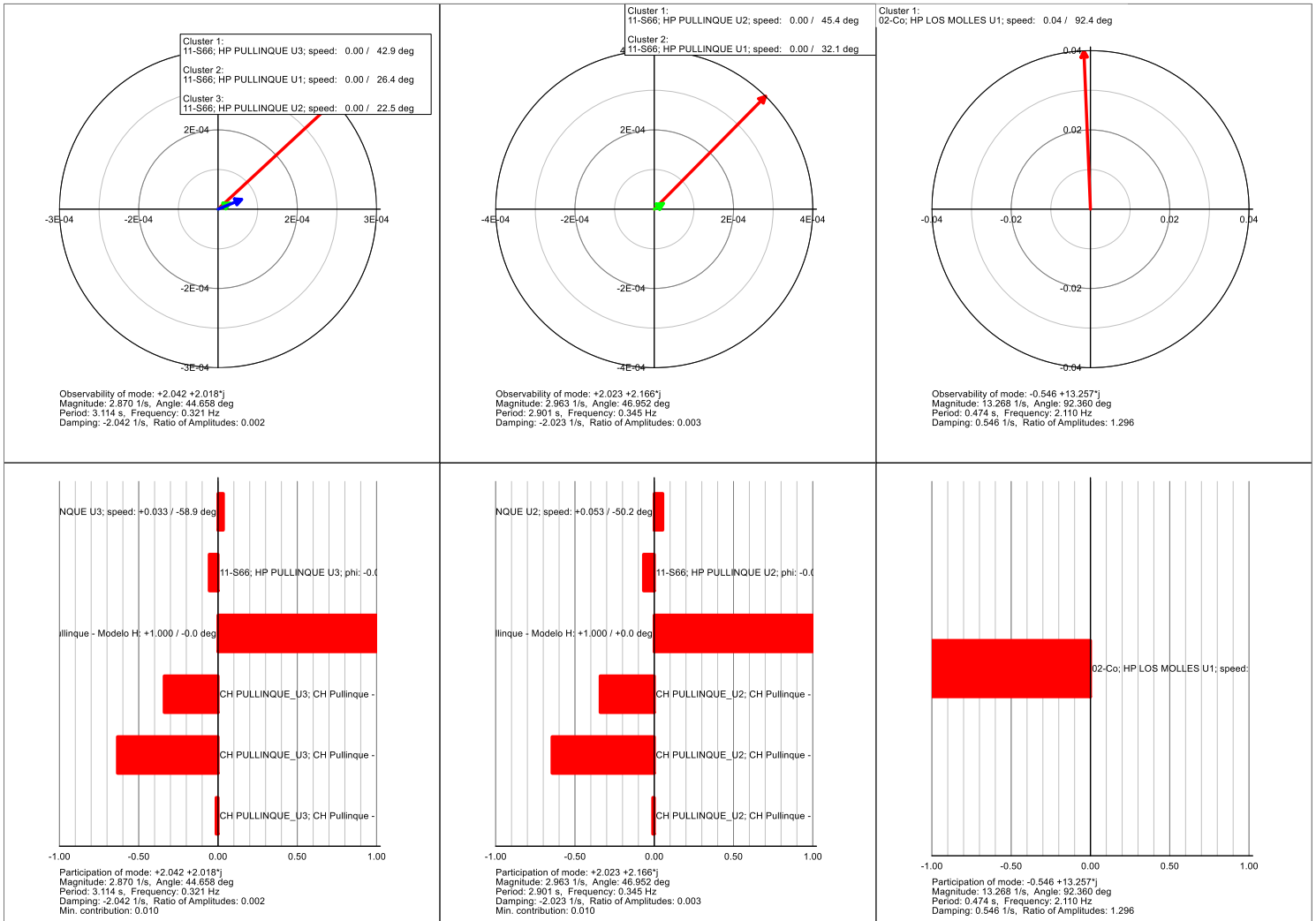


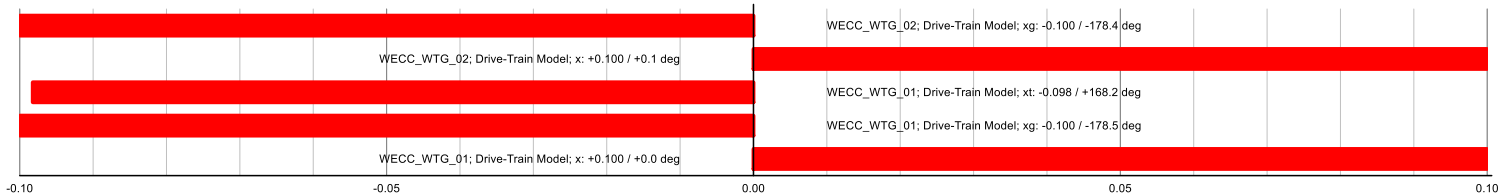
Participation of mode: -1.146 +12.269*j
Magnitude: 12.322 1/s, Angle: 95.336 deg
Period: 0.512 s, Frequency: 1.953 Hz
Damping: 1.146 1/s, Ratio of Amplitudes: 1.798
Min. contribution: 0.100



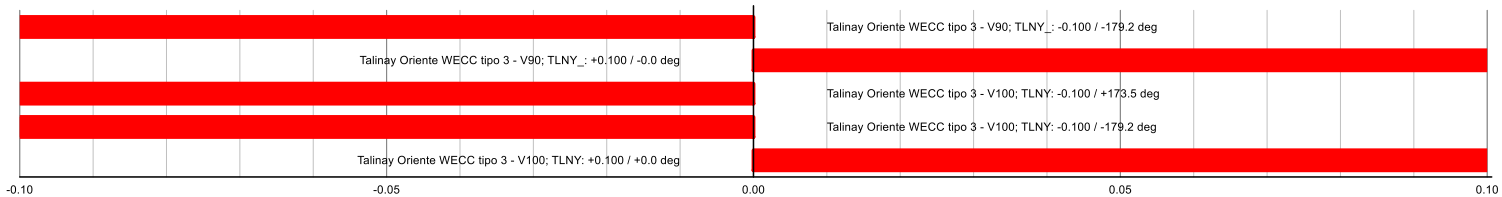
Participation of mode: -1.153 +12.279*j
Magnitude: 12.333 1/s, Angle: 95.364 deg
Period: 0.512 s, Frequency: 1.954 Hz
Damping: 1.153 1/s, Ratio of Amplitudes: 1.804
Min. contribution: 0.100

14.2.2 Red N-1 Caso 1.- Changos – Cumbre 500kV

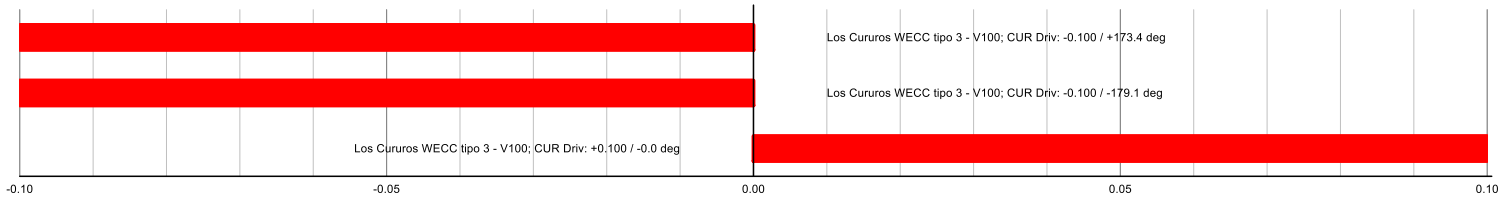




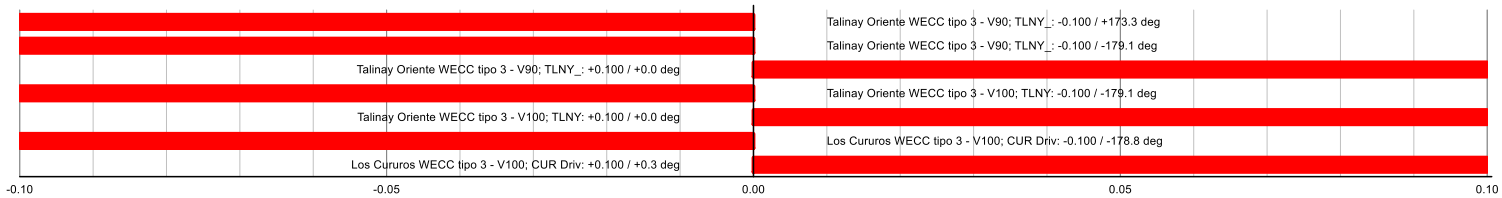
Participation of mode: -0.911 +9.912*j
Magnitude: 9.954 1/s, Angle: 95.253 deg
Period: 0.634 s, Frequency: 1.578 Hz
Damping: 0.911 1/s, Ratio of Amplitudes: 1.782
Min. contribution: 0.100



Participation of mode: -1.136 +12.255*j
Magnitude: 12.307 1/s, Angle: 95.296 deg
Period: 0.513 s, Frequency: 1.950 Hz
Damping: 1.136 1/s, Ratio of Amplitudes: 1.790
Min. contribution: 0.100

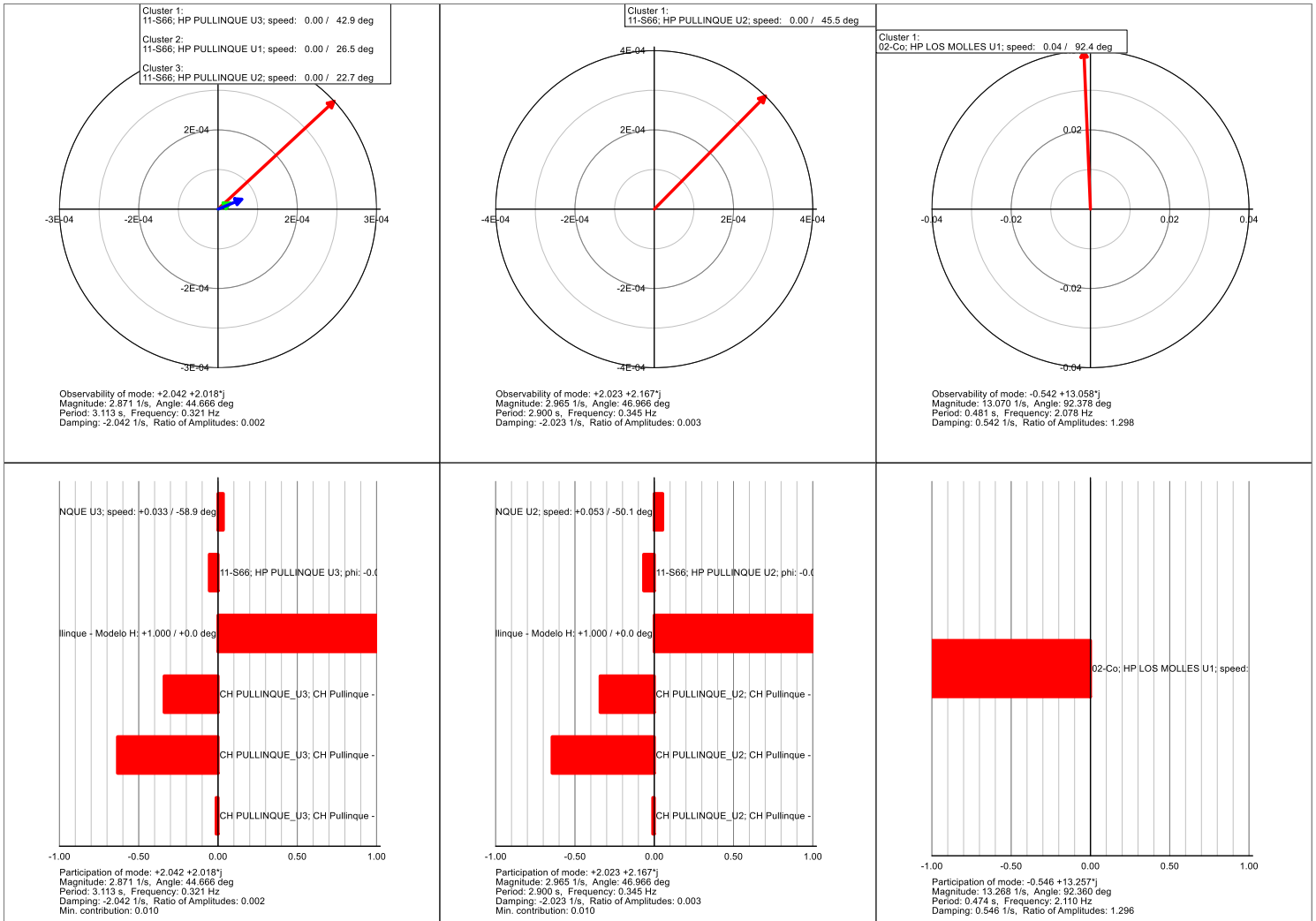


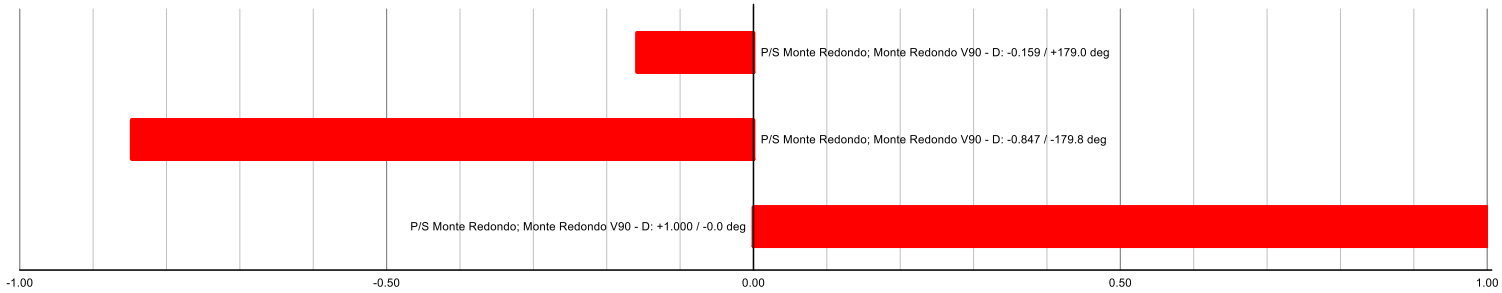
Participation of mode: -1.146 +12.269*j
Magnitude: 12.322 1/s, Angle: 95.336 deg
Period: 0.512 s, Frequency: 1.953 Hz
Damping: 1.146 1/s, Ratio of Amplitudes: 1.798
Min. contribution: 0.100



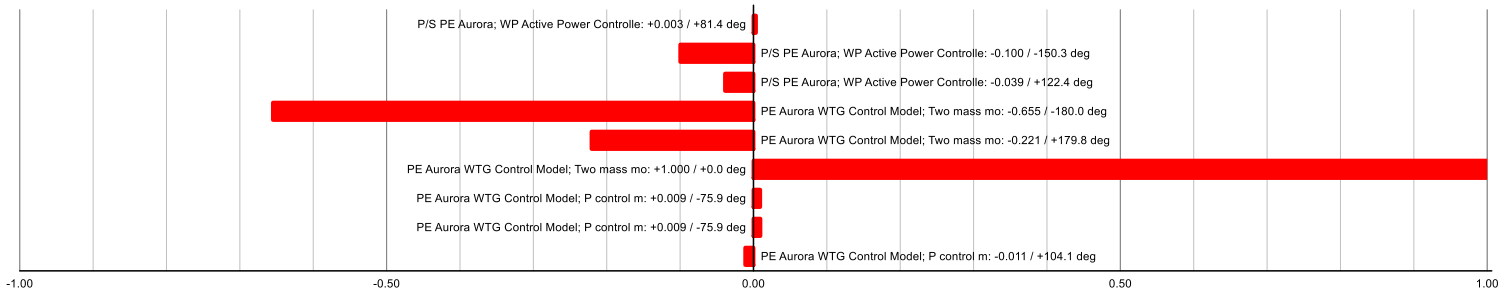
Participation of mode: -1.153 +12.279*j
Magnitude: 12.333 1/s, Angle: 95.364 deg
Period: 0.512 s, Frequency: 1.954 Hz
Damping: 1.153 1/s, Ratio of Amplitudes: 1.804
Min. contribution: 0.100

14.2.3 Red N-1 Caso 2:- Nueva Pan de Azúcar – Polpaico 500kV

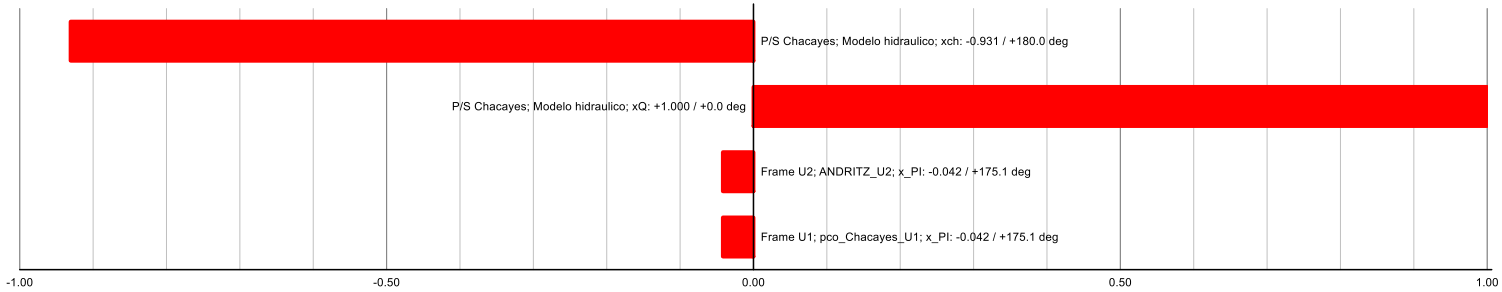




Participation of mode: -0.349 +9.758*j
Magnitude: 9.764 1/s, Angle: 92.046 deg
Period: 0.644 s, Frequency: 1.553 Hz
Damping: 0.349 1/s, Ratio of Amplitudes: 1.252
Min. contribution: 0.010

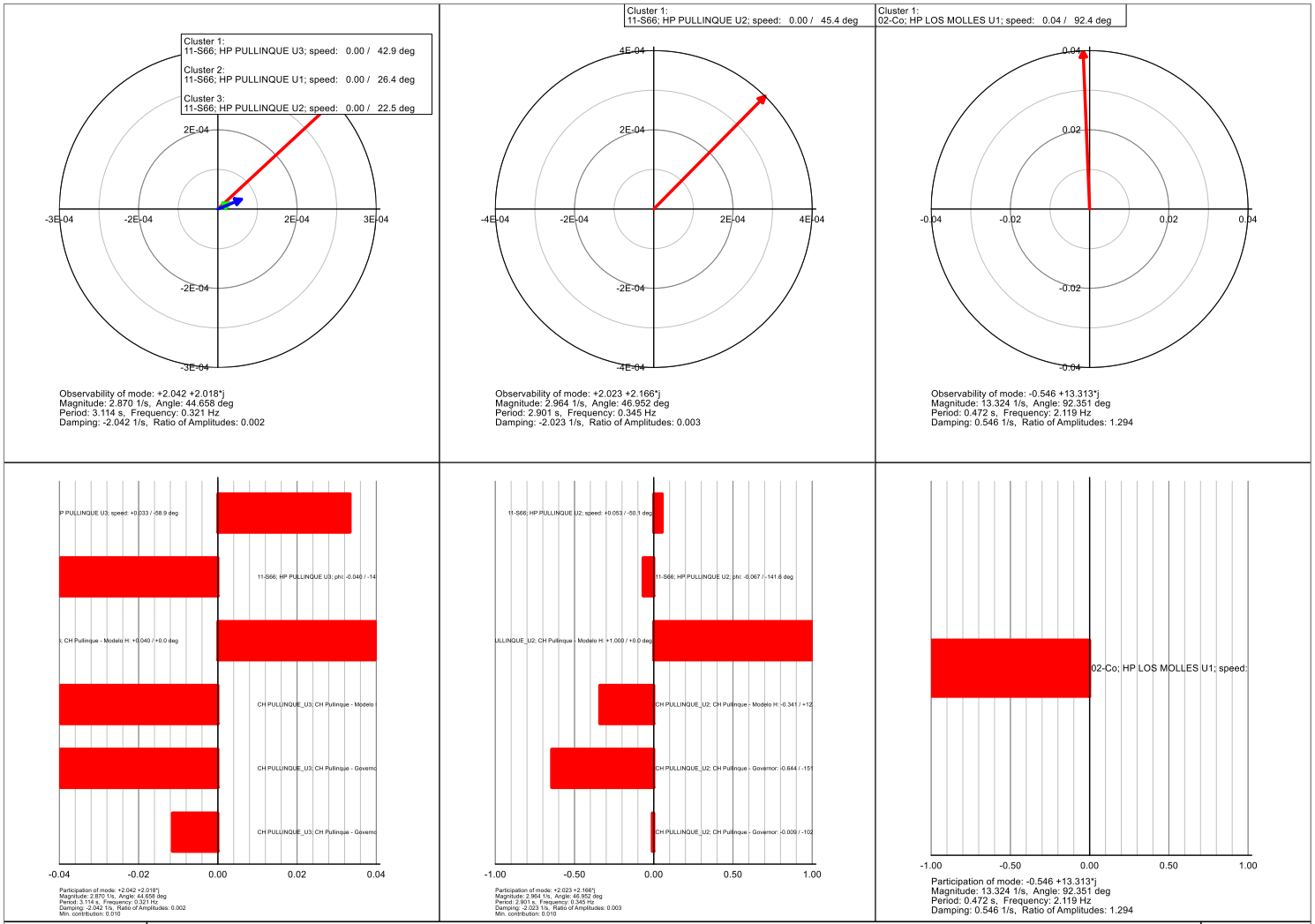


Participation of mode: -0.318 +8.360*j
Magnitude: 8.366 1/s, Angle: 92.178 deg
Period: 0.752 s, Frequency: 1.331 Hz
Damping: 0.318 1/s, Ratio of Amplitudes: 1.270
Min. contribution: 0.010



Participation of mode: -0.001 +0.043*j
Magnitude: 0.043 1/s, Angle: 91.601 deg
Period: 146.761 s, Frequency: 0.007 Hz
Damping: 0.001 1/s, Ratio of Amplitudes: 1.192
Min. contribution: 0.010

14.2.4 Red N-1 Caso 3.- Charrúa – Ancoa 500kV



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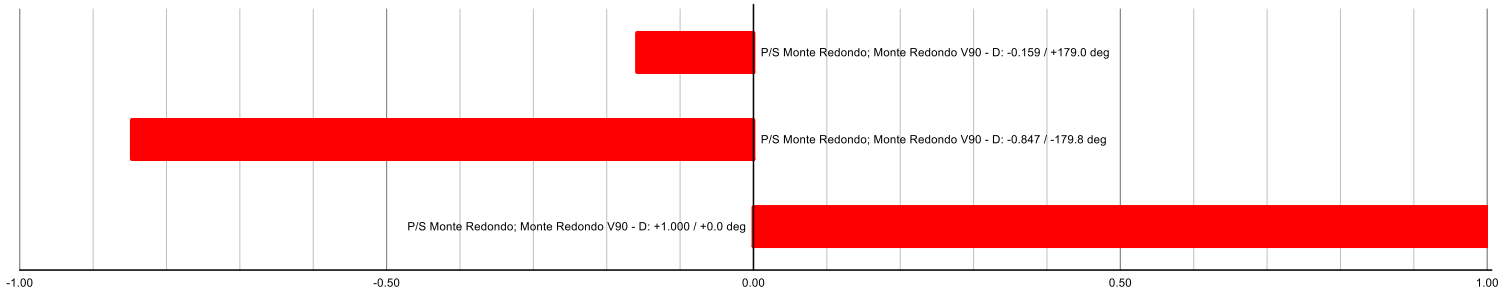
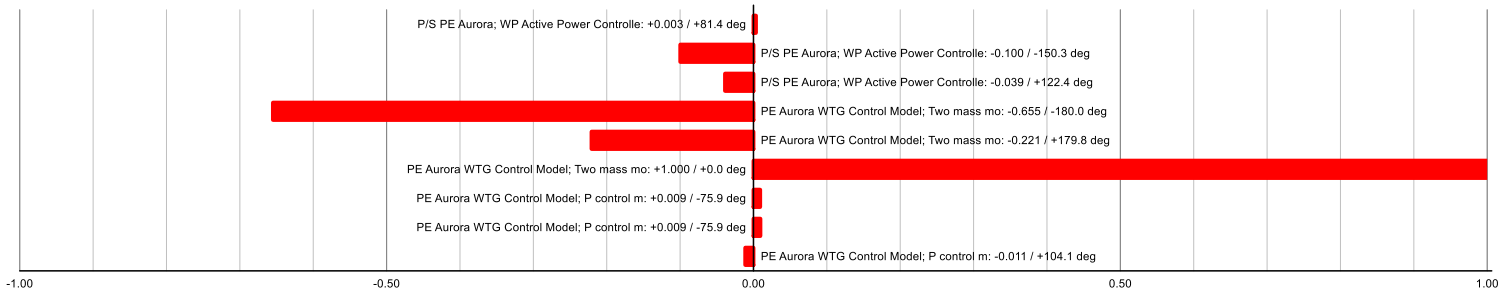
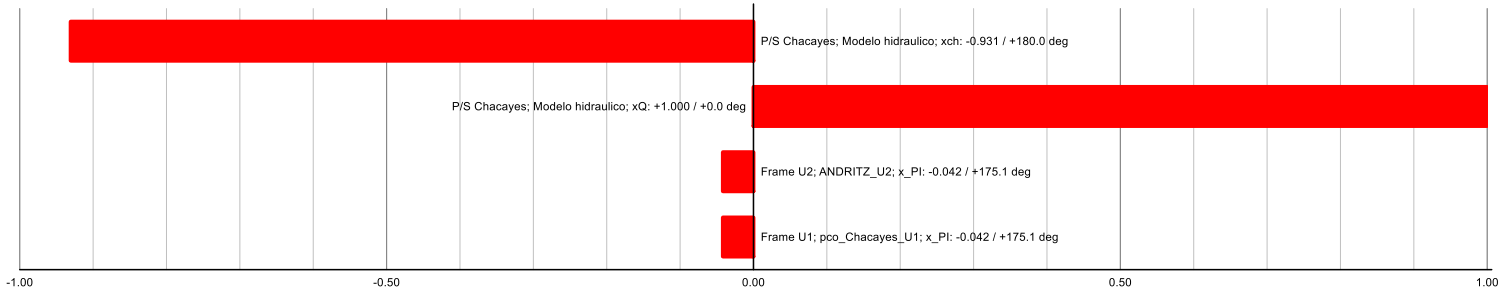


Participation of mode: -0.349 +9.757*j
Magnitude: 9.763 1/s, Angle: 92.046 deg
Period: 0.644 s, Frequency: 1.553 Hz
Damping: 0.349 1/s, Ratio of Amplitudes: 1.252
Min. contribution: 0.010



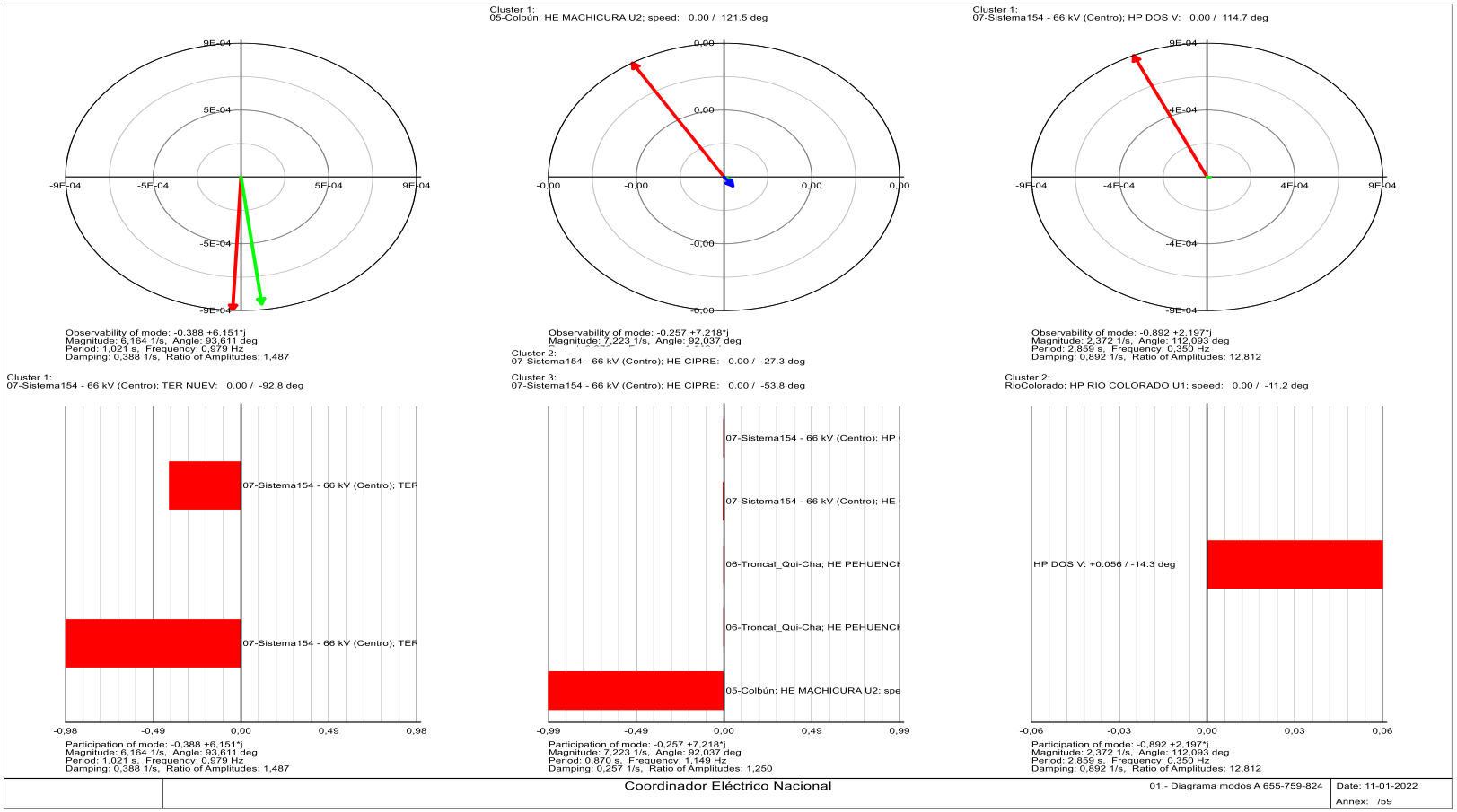
Participation of mode: -0.318 +8.360*j
Magnitude: 8.366 1/s, Angle: 92.178 deg
Period: 0.752 s, Frequency: 1.331 Hz
Damping: 0.318 1/s, Ratio of Amplitudes: 1.270
Min. contribution: 0.010



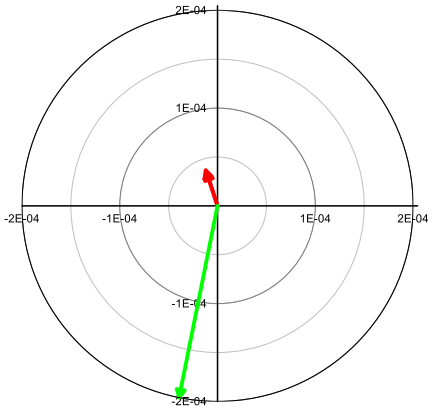
Participation of mode: -0.001 +0.043*j
Magnitude: 0.043 1/s, Angle: 91.602 deg
Period: 146.765 s, Frequency: 0.007 Hz
Damping: 0.001 1/s, Ratio of Amplitudes: 1.192
Min. contribution: 0.010

14.3 Escenario E3 DA noche Dic2022

14.3.1 Red N

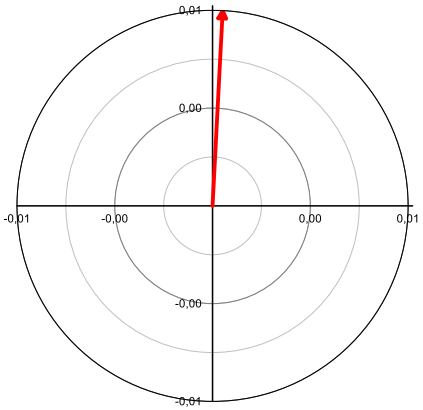


Cluster 1:
04-Enel Distribución; HP PUNTILLA U1; sp: 0.00 / 107.8 deg
04-Enel Distribución; HP PUNTILLA U2; sp: 0.00 / 108.4 deg



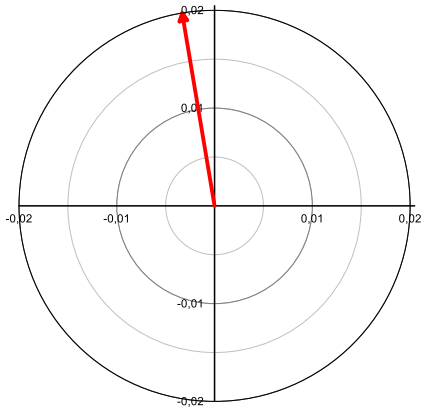
Observability of mode: -0,438 -0,797*j
Magnitude: 0,909 1/s, Angle: -118,807 deg
Period: 7,885 s, Frequency: 0,127 Hz
Damping: 0,438 1/s, Ratio of Amplitudes: 31,663

Cluster 1:
02-Coquimbo; HP LOS MOLLES U1; speed: 0.01 / 87.0 deg



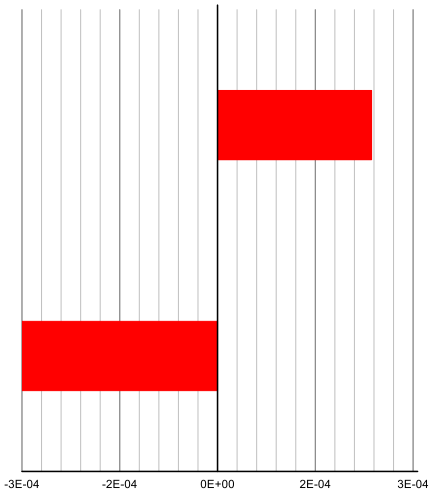
Observability of mode: -0,568 -13,552*j
Magnitude: 13,564 1/s, Angle: -92,400 deg
Period: 0,464 s, Frequency: 2,157 Hz
Damping: 0,568 1/s, Ratio of Amplitudes: 1,301

Cluster 1:
07-Sistema154 - 66 kV (Centro); HP SAN I: 0.02 / 99.5 deg

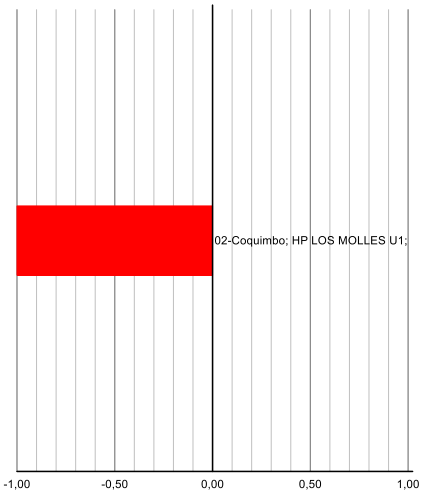


Observability of mode: -0,620 +8,887*j
Magnitude: 8,909 1/s, Angle: 93,994 deg
Period: 0,707 s, Frequency: 1,414 Hz
Damping: 0,620 1/s, Ratio of Amplitudes: 1,551

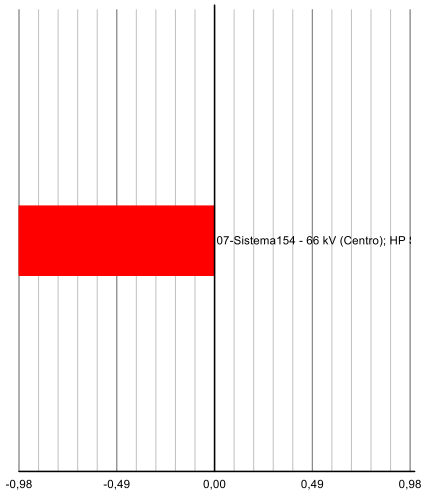
Cluster 2:
04-Enel Distribución; HP VOLCAN U1; spee: 0.00 / -101.3 deg



Participation of mode: -0,438 -0,797*j
Magnitude: 0,909 1/s, Angle: -118,807 deg
Period: 7,885 s, Frequency: 0,127 Hz
Damping: 0,438 1/s, Ratio of Amplitudes: 31,663

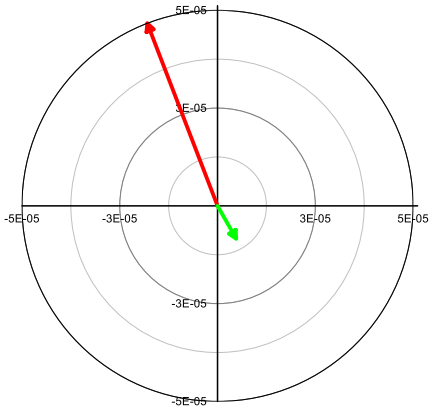


Participation of mode: -0,568 -13,552*j
Magnitude: 13,564 1/s, Angle: -92,400 deg
Period: 0,464 s, Frequency: 2,157 Hz
Damping: 0,568 1/s, Ratio of Amplitudes: 1,301



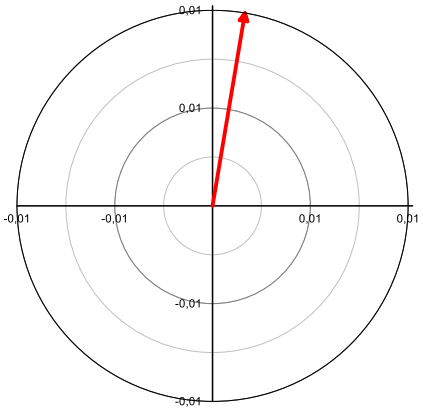
Participation of mode: -0,620 +8,887*j
Magnitude: 8,909 1/s, Angle: 93,994 deg
Period: 0,707 s, Frequency: 1,414 Hz
Damping: 0,620 1/s, Ratio of Amplitudes: 1,551

Cluster 1:
01-Atacama; TER GUACOLDA U3; speed: 0.00 / 111.0 deg



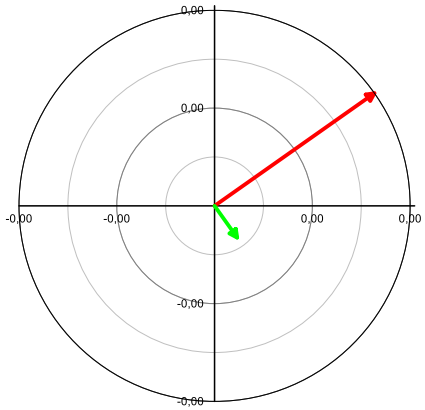
Observability of mode: -0,623 +0,788*j
Magnitude: 1,005 1/s, Angle: 128,353 deg
Period: 7,975 s, Frequency: 0,125 Hz
Damping: 0,623 1/s, Ratio of Amplitudes: 144,251

Cluster 1:
10-Araucanía; HP CARILAFQUEN U1; speed: 0.01 / 80.5 deg



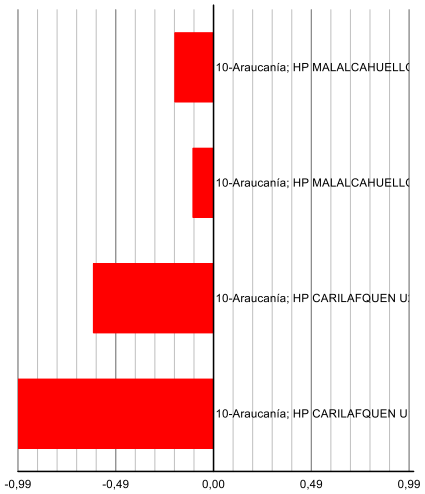
Observability of mode: -0,640 +9,774*j
Magnitude: 9,795 1/s, Angle: 93,744 deg
Period: 0,643 s, Frequency: 1,556 Hz
Damping: 0,640 1/s, Ratio of Amplitudes: 1,509

Cluster 1:
03-Chilquinta-Aconcagua; HP JUNCAL U1; s: 0.00 / 35.2 deg

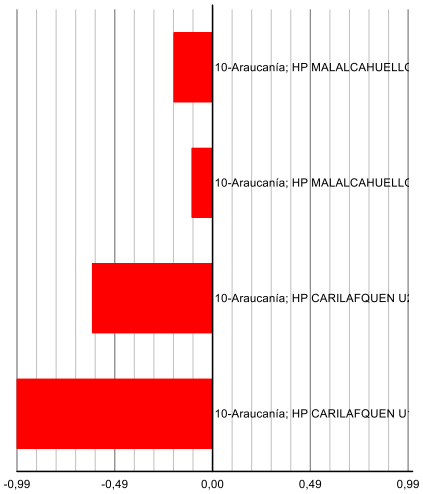


Observability of mode: -0,682 +9,005*j
Magnitude: 9,031 1/s, Angle: 94,329 deg
Period: 0,698 s, Frequency: 1,433 Hz
Damping: 0,682 1/s, Ratio of Amplitudes: 1,609

Cluster 2:
01-Atacama; TER GUACOLDA U5; speed: 0.00 / -60.4 deg

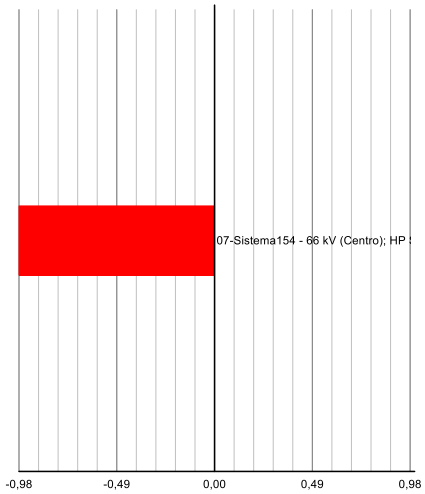


Participation of mode: -0,640 +9,774*j
Magnitude: 9,795 1/s, Angle: 93,744 deg
Period: 0,643 s, Frequency: 1,556 Hz
Damping: 0,640 1/s, Ratio of Amplitudes: 1,509



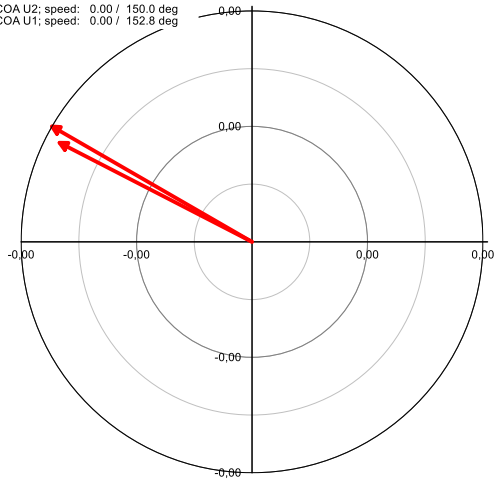
Participation of mode: -0,640 +9,774*j
Magnitude: 9,795 1/s, Angle: 93,744 deg
Period: 0,643 s, Frequency: 1,556 Hz
Damping: 0,640 1/s, Ratio of Amplitudes: 1,509

Cluster 2:
03-Chilquinta-Aconcagua; HP LOS QUILOS U: 0.00 / -54.5 deg



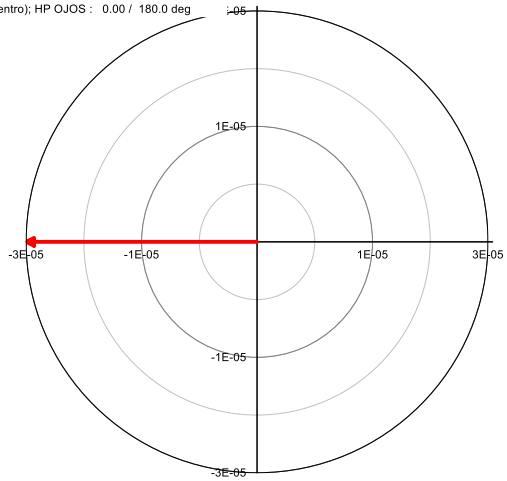
Participation of mode: -0,620 +8,887*j
Magnitude: 8,909 1/s, Angle: 93,994 deg
Period: 0,707 s, Frequency: 1,414 Hz
Damping: 0,620 1/s, Ratio of Amplitudes: 1,551

Cluster 1:
Embalse Ancoa(1); HE ANCOA U2; speed: 0.00 / 150.0 deg
Embalse Ancoa(1); HE ANCOA U1; speed: 0.00 / 152.8 deg

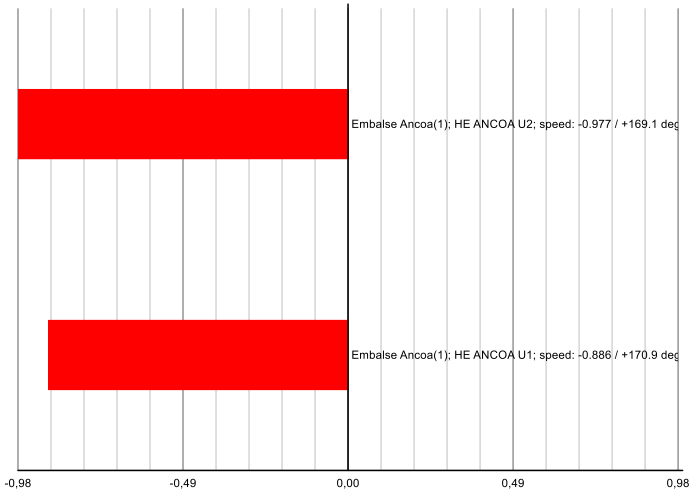


Observability of mode: -0,828 -7,982*j
Magnitude: 8,025 1/s, Angle: -95,919 deg
Period: 0,787 s, Frequency: 1,270 Hz
Damping: 0,828 1/s, Ratio of Amplitudes: 1,918

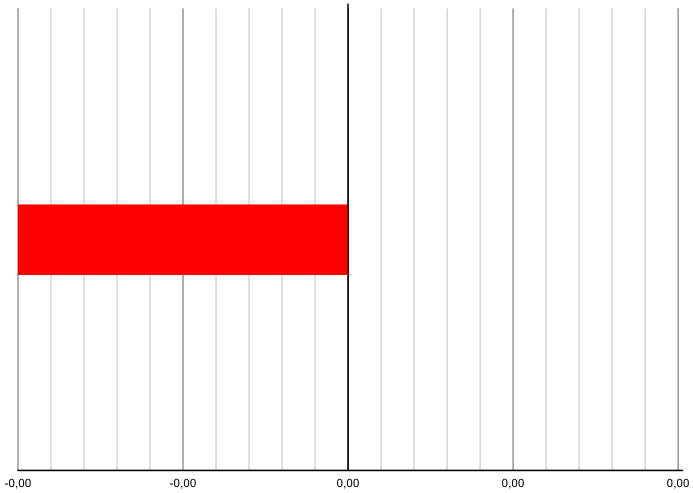
Cluster 1:
07-Sistema154 - 66 kV (Centro); HP OJOS : 0.00 / 180.0 deg



Observability of mode: -0,835 +0,000*j
Magnitude: 0,835 1/s, Angle: 180,000 deg
Period: nan s, Frequency: 0,000 Hz
Damping: 0,835 1/s, Ratio of Amplitudes: nan

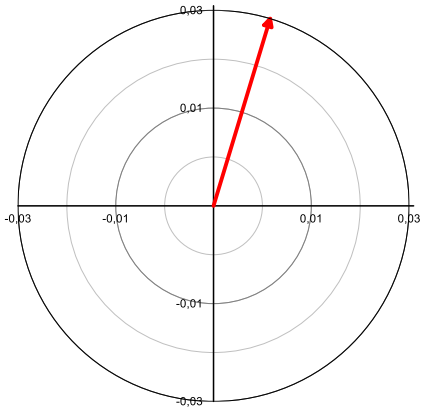


Participation of mode: -0,828 -7,982*j
Magnitude: 8,025 1/s, Angle: -95,919 deg
Period: 0,787 s, Frequency: 1,270 Hz
Damping: 0,828 1/s, Ratio of Amplitudes: 1,918



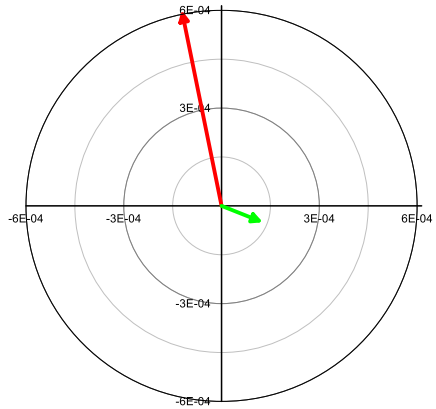
Participation of mode: -0,835 +0,000*j
Magnitude: 0,835 1/s, Angle: 180,000 deg
Period: nan s, Frequency: 0,000 Hz
Damping: 0,835 1/s, Ratio of Amplitudes: nan

Cluster 1:
11-Araucanía 66 kV; HP PALMAR U1; speed: 0.03 / 73.2 deg



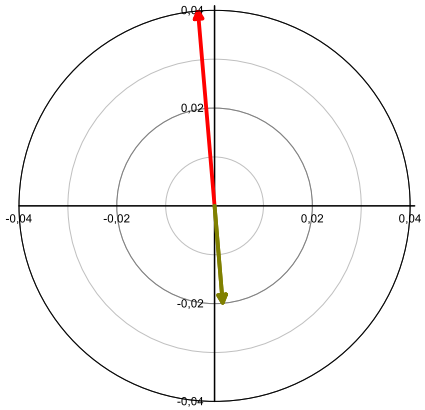
Observability of mode: -0,863 -9,384*j
Magnitude: 9,424 1/s, Angle: -95,253 deg
Period: 0,670 s, Frequency: 1,494 Hz
Damping: 0,863 1/s, Ratio of Amplitudes: 1,782

Cluster 1:
07-Sistema154 - 66 kV (Centro); HP ISLA : 0.00 / 101.5 deg



Observability of mode: -0,926 +0,435*j
Magnitude: 1,023 1/s, Angle: 154,811 deg
Period: 14,433 s, Frequency: 0,069 Hz
Damping: 0,926 1/s, Ratio of Amplitudes: 633372,979

Cluster 1:
11-Araucanía 66 kV; HE PILMAIQUEN U1; sp: 0.04 / 94.9 deg

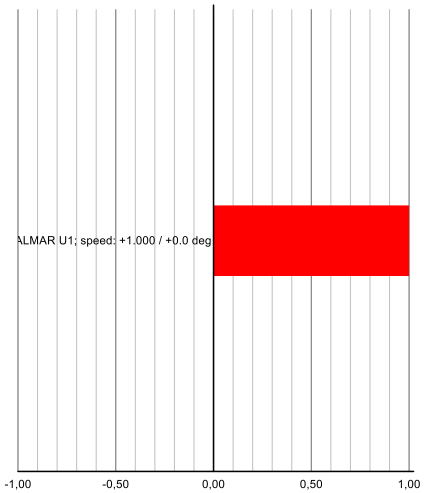


Cluster 2:
11-Araucanía 66 kV; HE PILMAIQUEN U4; sp: 0.00 / -54.1 deg

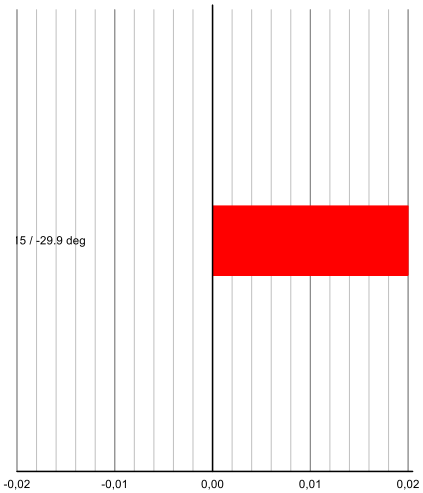
Cluster 3:
11-Araucanía 66 kV; HE PILMAIQUEN U5; sp: 0.00 / -67.1 deg

Cluster 4:
11-Araucanía 66 kV; HE PILMAIQUEN U2; sp: 0.02 / -85.2 deg
11-Araucanía 66 kV; HE PILMAIQUEN U3; sp: 0.02 / -85.2 deg

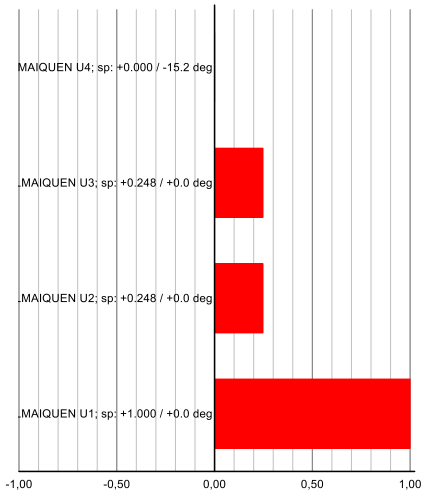
Cluster 2:
07-Sistema154 - 66 kV (Centro); HP ISLA : 0.00 / -21.7 deg



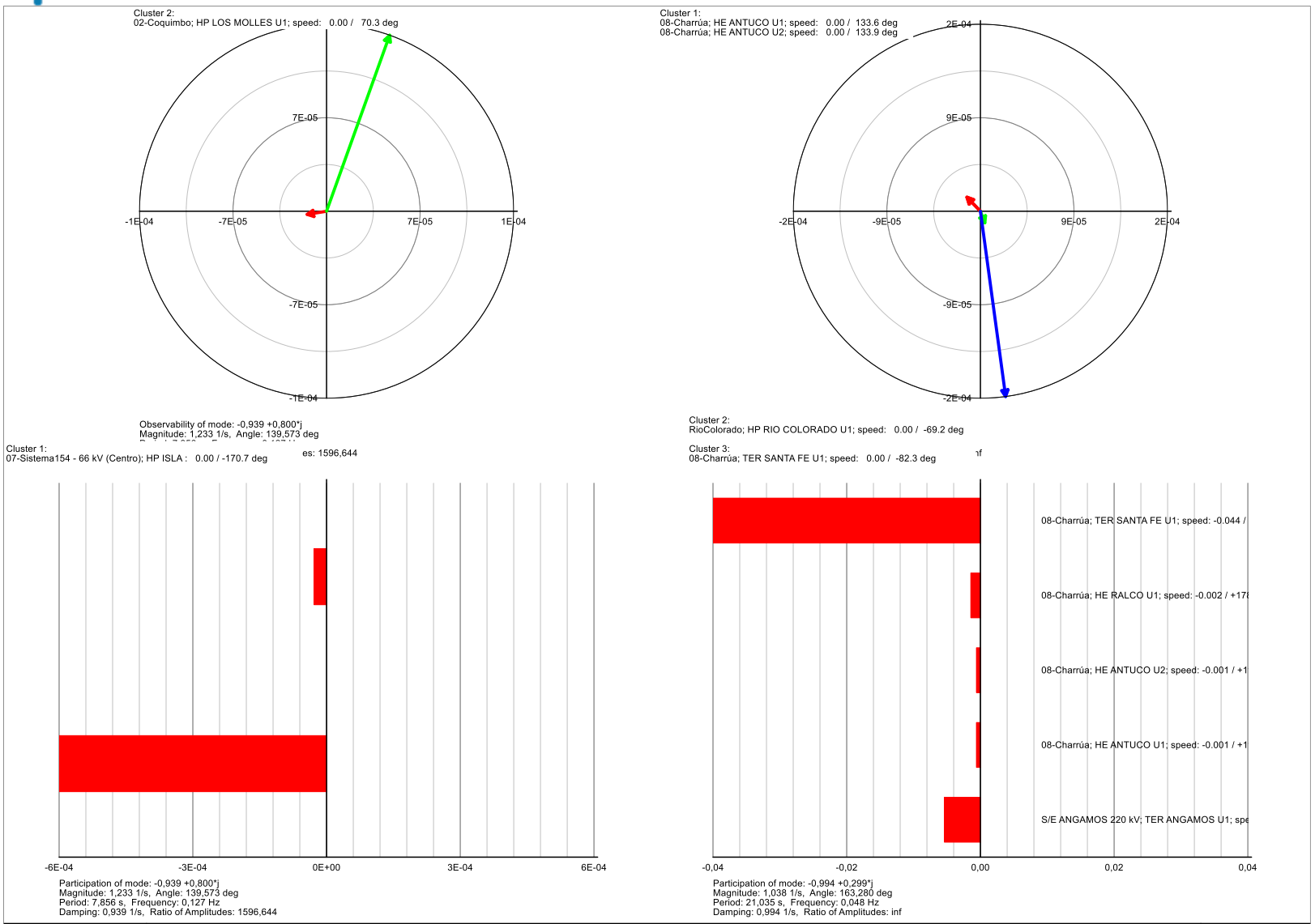
Participation of mode: -0,863 -9,384*j
Magnitude: 9,424 1/s, Angle: -95,253 deg
Period: 0,670 s, Frequency: 1,494 Hz
Damping: 0,863 1/s, Ratio of Amplitudes: 1,782



Participation of mode: -0,926 +0,435*j
Magnitude: 1,023 1/s, Angle: 154,811 deg
Period: 14,433 s, Frequency: 0,069 Hz
Damping: 0,926 1/s, Ratio of Amplitudes: 633372,979



Participation of mode: -0,934 +10,962*j
Magnitude: 11,001 1/s, Angle: 94,870 deg
Period: 0,573 s, Frequency: 1,745 Hz
Damping: 0,934 1/s, Ratio of Amplitudes: 1,708



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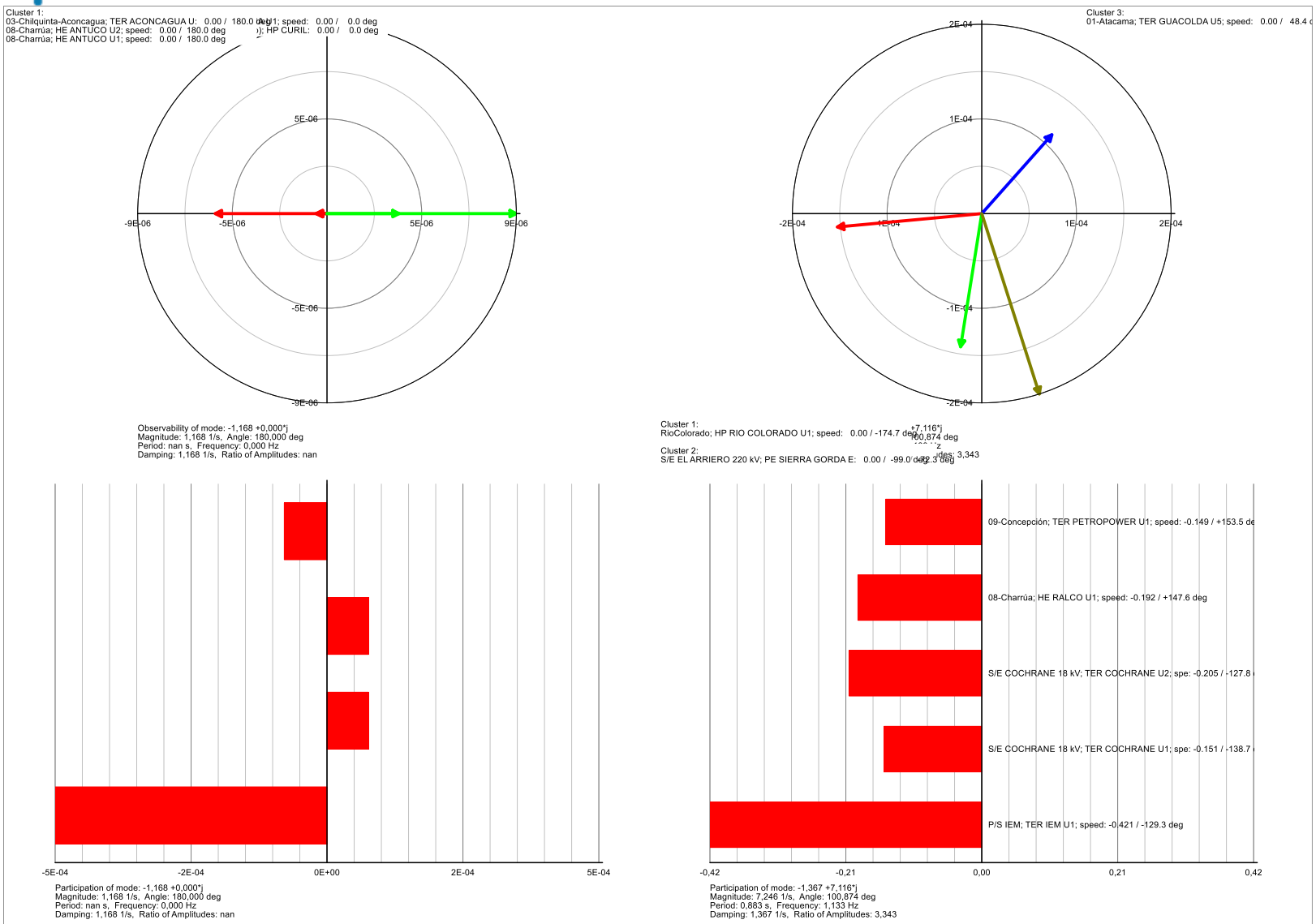
			Annex: /66



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07.- Diagrama modos A 1176-1313-13(8)

Date: 11-01-2022

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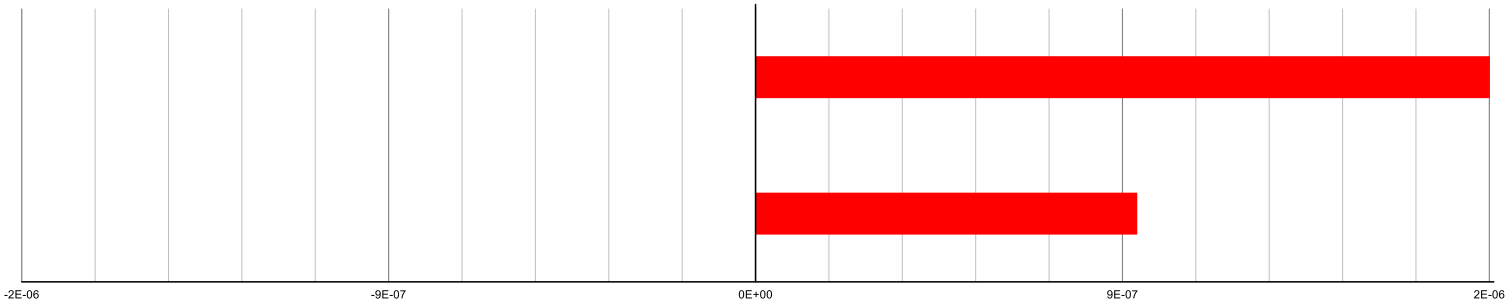
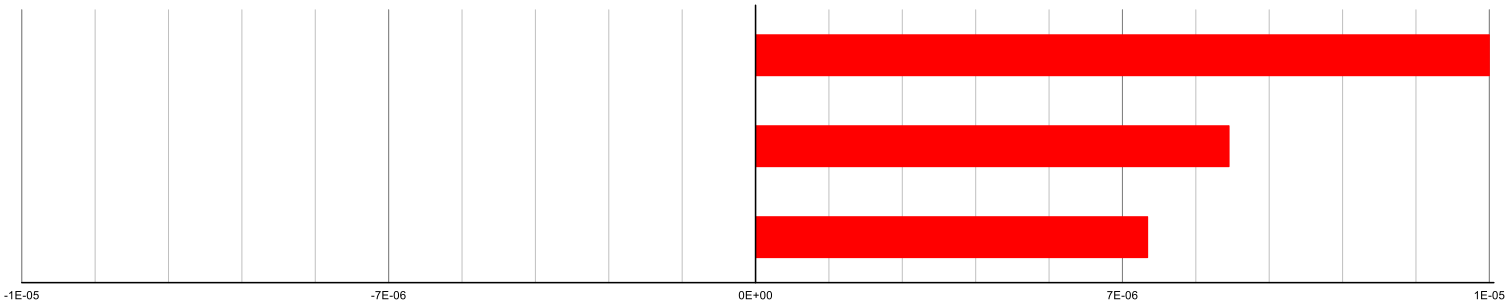
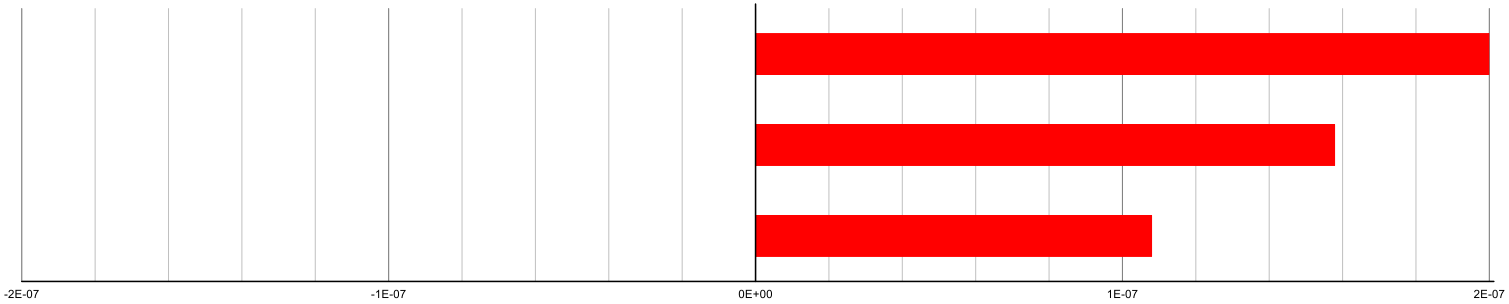


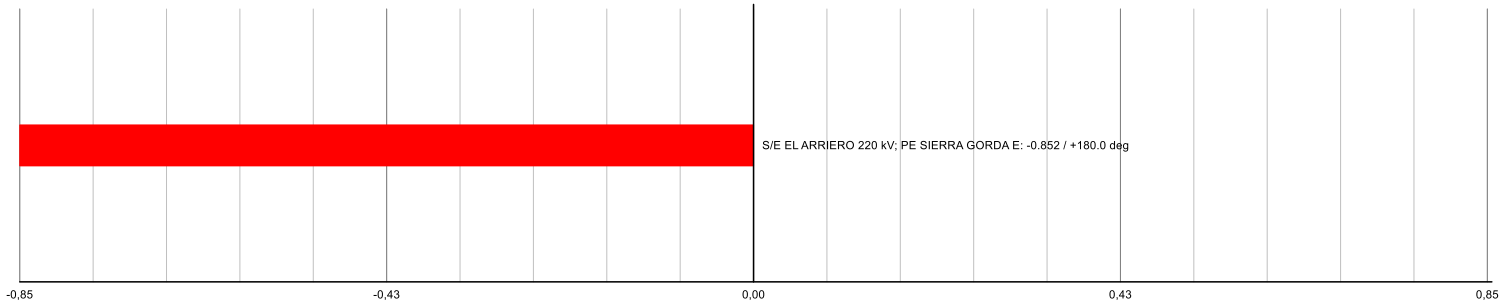
Participation of mode: -0,328 +9,753*j
Magnitude: 9,758 1/s, Angle: 91,927 deg
Period: 0,644 s, Frequency: 1,552 Hz
Damping: 0,328 1/s, Ratio of Amplitudes: 1,235



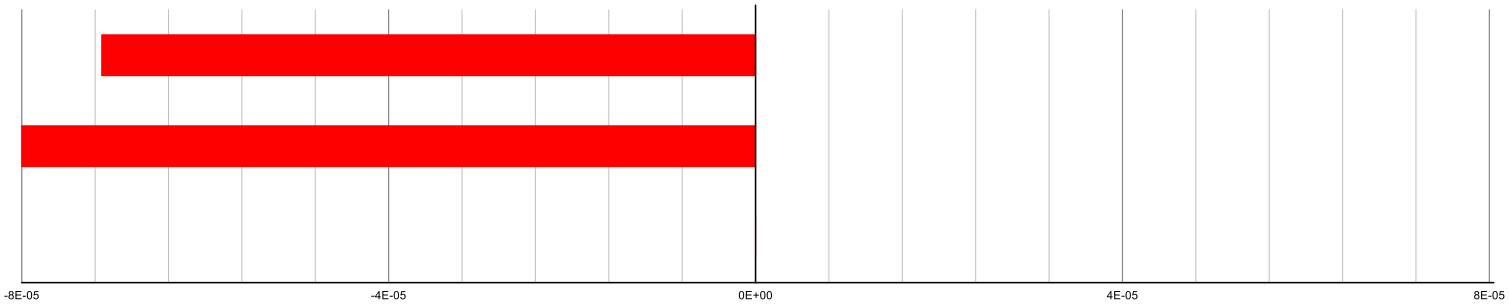
Participation of mode: -0,375 +5,300*j
Magnitude: 5,313 1/s, Angle: 94,051 deg
Period: 1,186 s, Frequency: 0,843 Hz
Damping: 0,375 1/s, Ratio of Amplitudes: 1,560



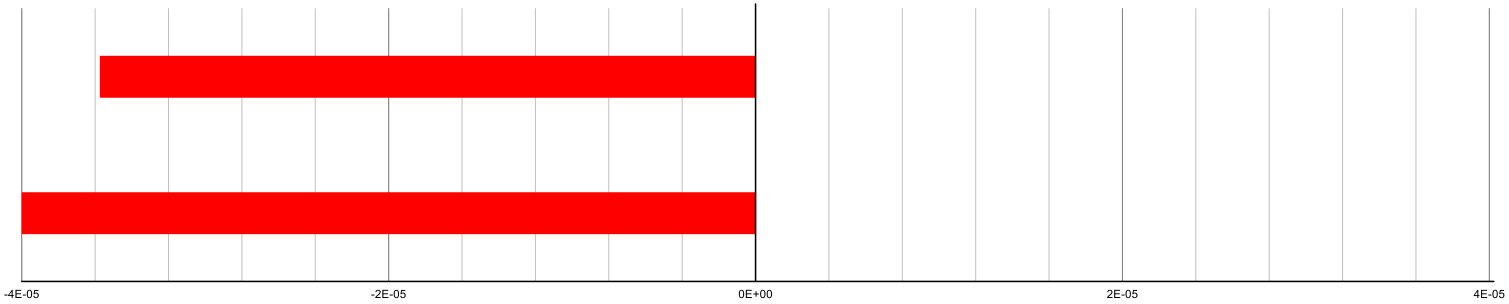
Participation of mode: -0,376 +5,313*j
Magnitude: 5,326 1/s, Angle: 94,051 deg
Period: 1,183 s, Frequency: 0,846 Hz
Damping: 0,376 1/s, Ratio of Amplitudes: 1,561



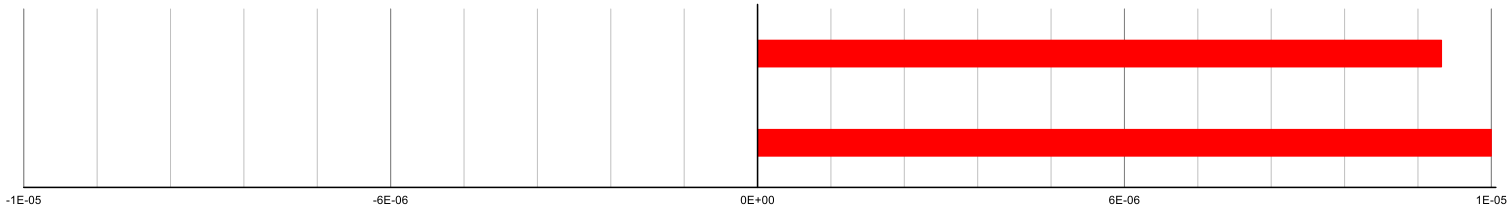
Participation of mode: -0,605 +9,780*j
Magnitude: 9,799 1/s, Angle: 93,541 deg
Period: 0,642 s, Frequency: 1,557 Hz
Damping: 0,605 1/s, Ratio of Amplitudes: 1,475



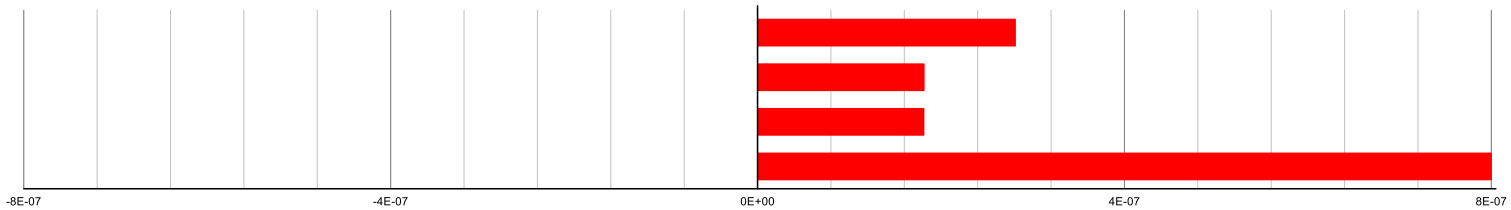
Participation of mode: -0,712 +11,111*j
Magnitude: 11,134 1/s, Angle: 93,666 deg
Period: 0,565 s, Frequency: 1,768 Hz
Damping: 0,712 1/s, Ratio of Amplitudes: 1,496



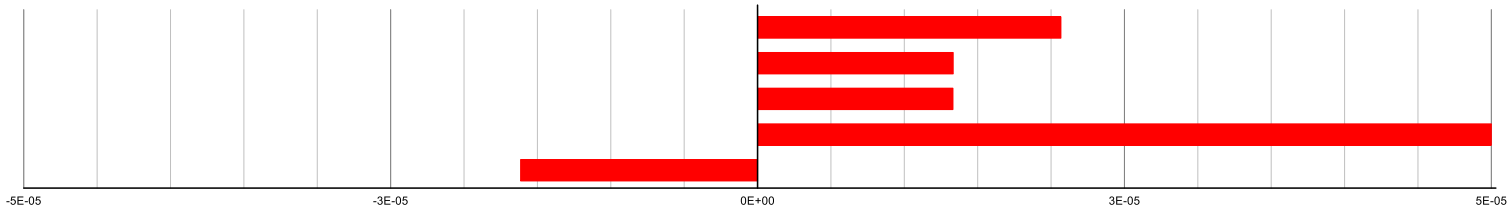
Participation of mode: -0,674 +11,099*j
Magnitude: 11,119 1/s, Angle: 93,474 deg
Period: 0,566 s, Frequency: 1,766 Hz
Damping: 0,674 1/s, Ratio of Amplitudes: 1,464



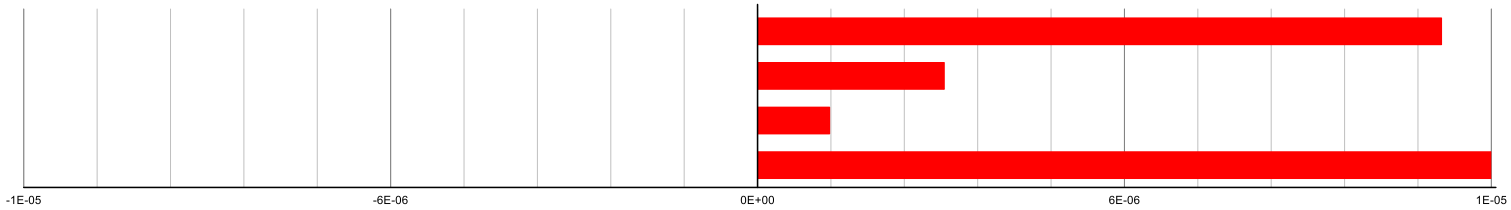
Participation of mode: -0,897 +9,897*j
Magnitude: 9,938 1/s, Angle: 95,179 deg
Period: 0,635 s, Frequency: 1,575 Hz
Damping: 0,897 1/s, Ratio of Amplitudes: 1,767



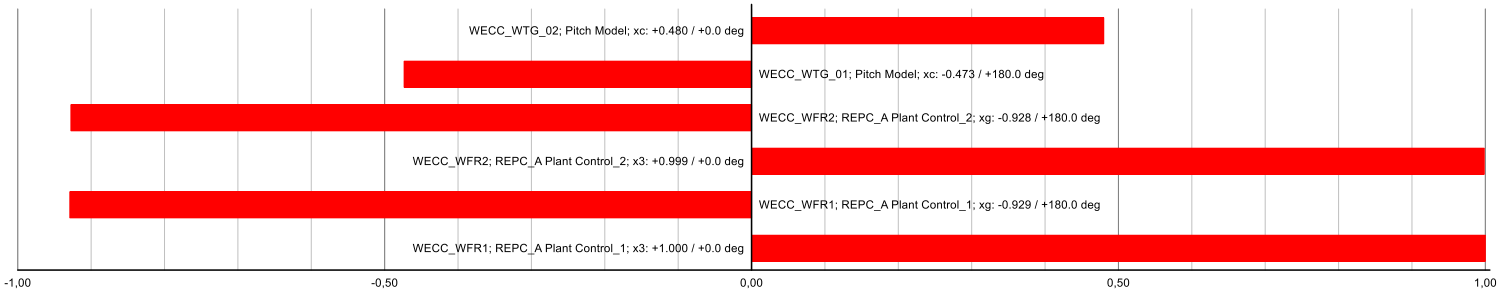
Participation of mode: -1,176 +12,257*j
Magnitude: 12,314 1/s, Angle: 95,478 deg
Period: 0,513 s, Frequency: 1,951 Hz
Damping: 1,176 1/s, Ratio of Amplitudes: 1,827



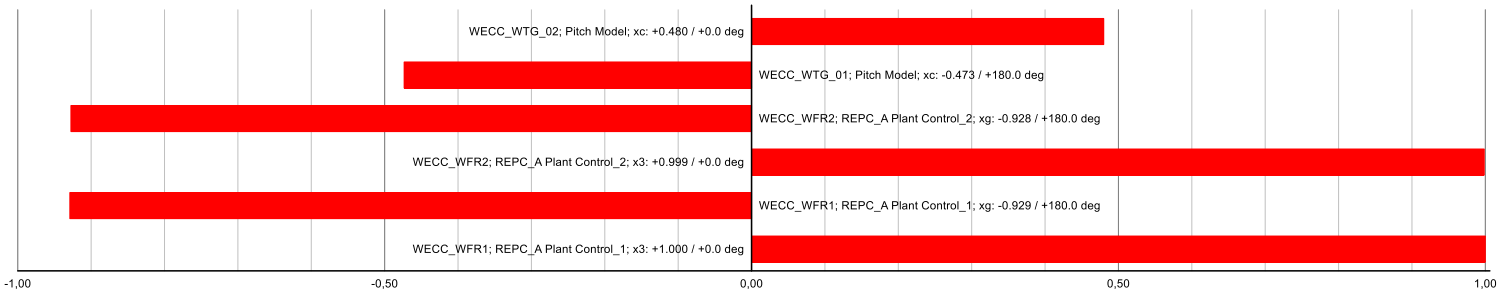
Participation of mode: -1,186 +12,269*j
Magnitude: 12,326 1/s, Angle: 95,522 deg
Period: 0,512 s, Frequency: 1,953 Hz
Damping: 1,186 1/s, Ratio of Amplitudes: 1,836



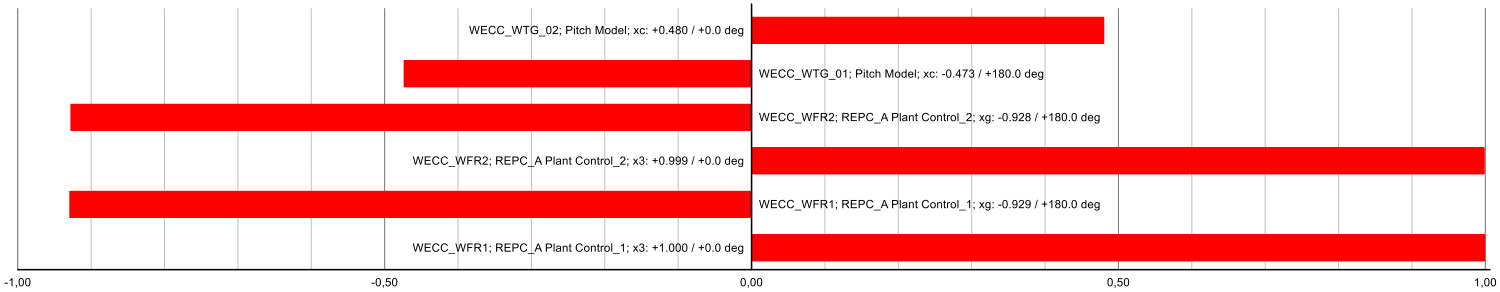
Participation of mode: -0,897 +9,897*j
Magnitude: 9,938 1/s, Angle: 95,179 deg
Period: 0,635 s, Frequency: 1,575 Hz
Damping: 0,897 1/s, Ratio of Amplitudes: 1,767



Participation of mode: -0,000 +0,000*j
Magnitude: 0,000 1/s, Angle: 90,973 deg
Period: nan s, Frequency: 0,000 Hz
Damping: 0,000 1/s, Ratio of Amplitudes: nan
Min. contribution: 0,100

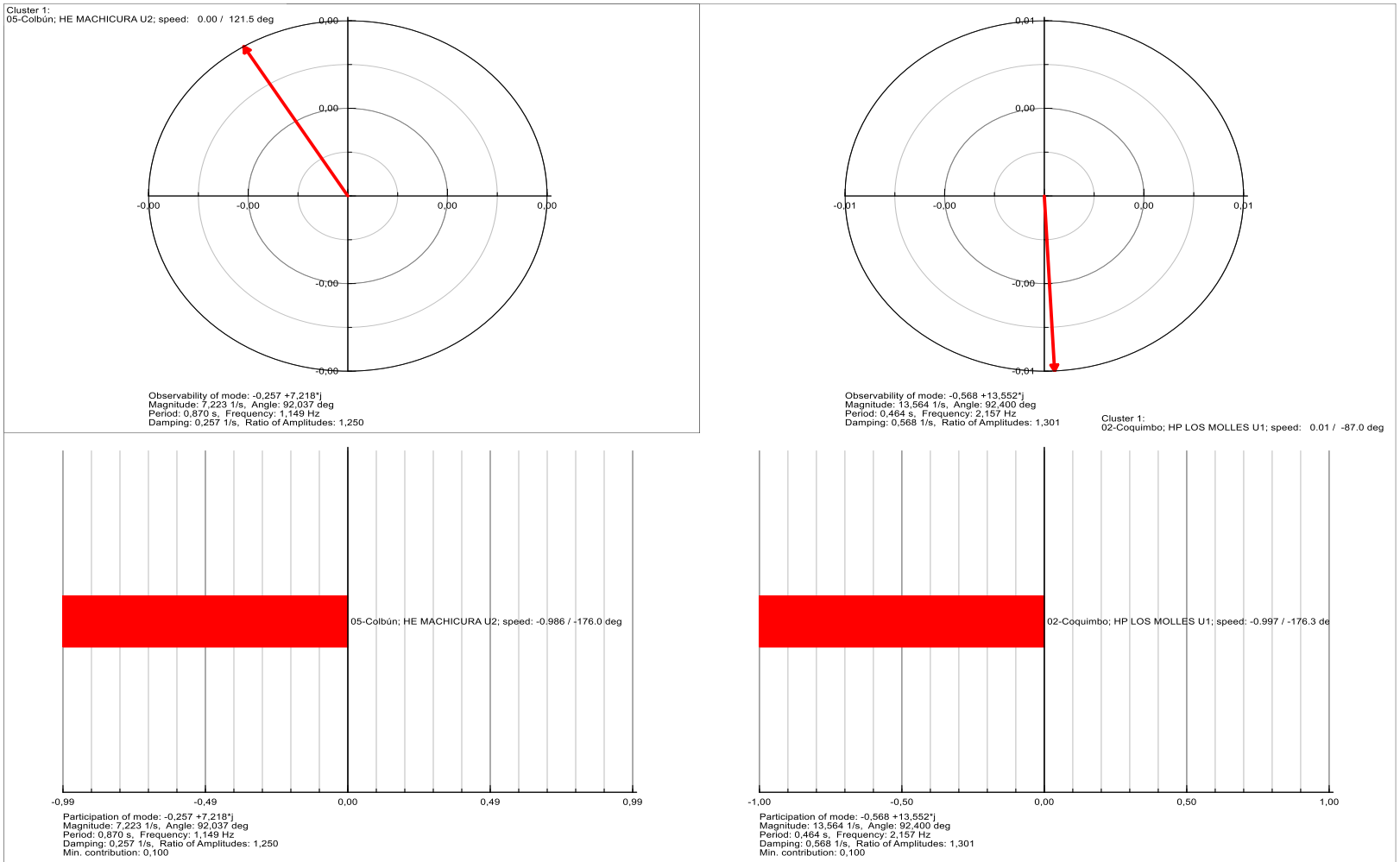


Participation of mode: -0,000 +0,000*j
Magnitude: 0,000 1/s, Angle: 90,973 deg
Period: nan s, Frequency: 0,000 Hz
Damping: 0,000 1/s, Ratio of Amplitudes: nan
Min. contribution: 0,100

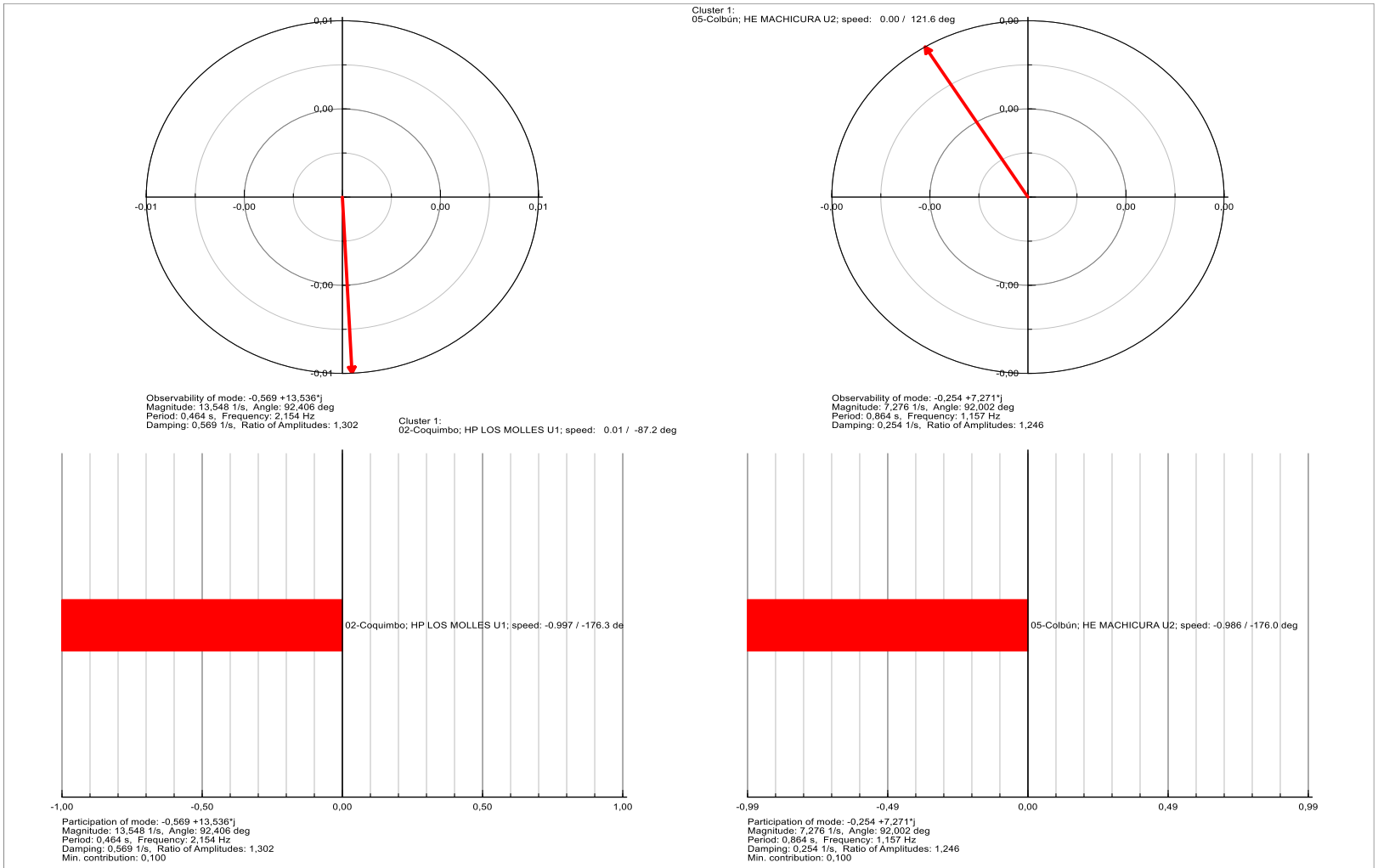


Participation of mode: -0,000 +0,000*j
Magnitude: 0,000 1/s, Angle: 90,973 deg
Period: nan s, Frequency: 0,000 Hz
Damping: 0,000 1/s, Ratio of Amplitudes: nan
Min. contribution: 0,100

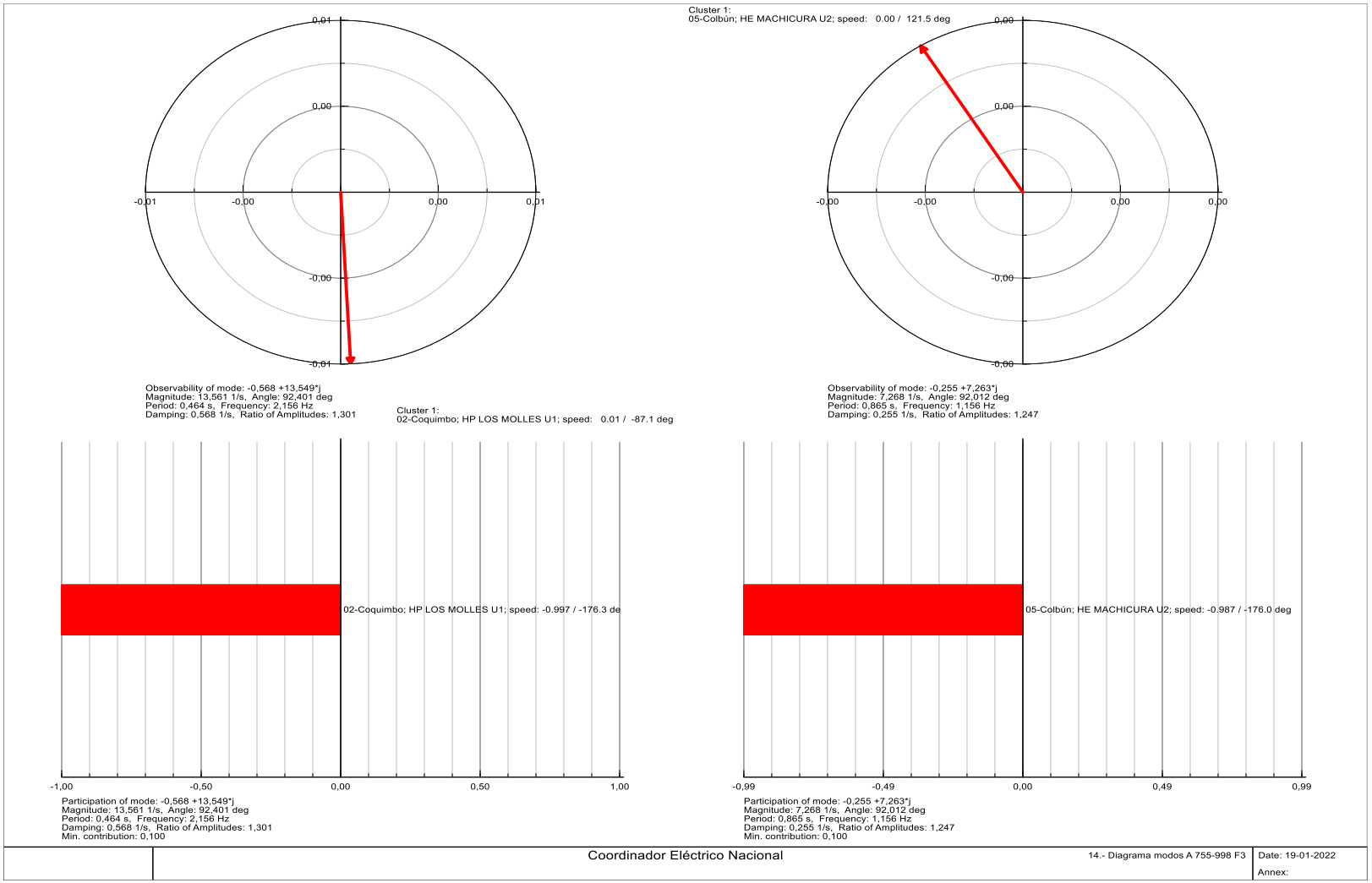
14.3.2 Red N-1 Caso 1.- Changos Cumbres 500 kV



14.3.3 Red N-1 Caso 2.- Nueva Pan de Azúcar - Polpaico 500 kV

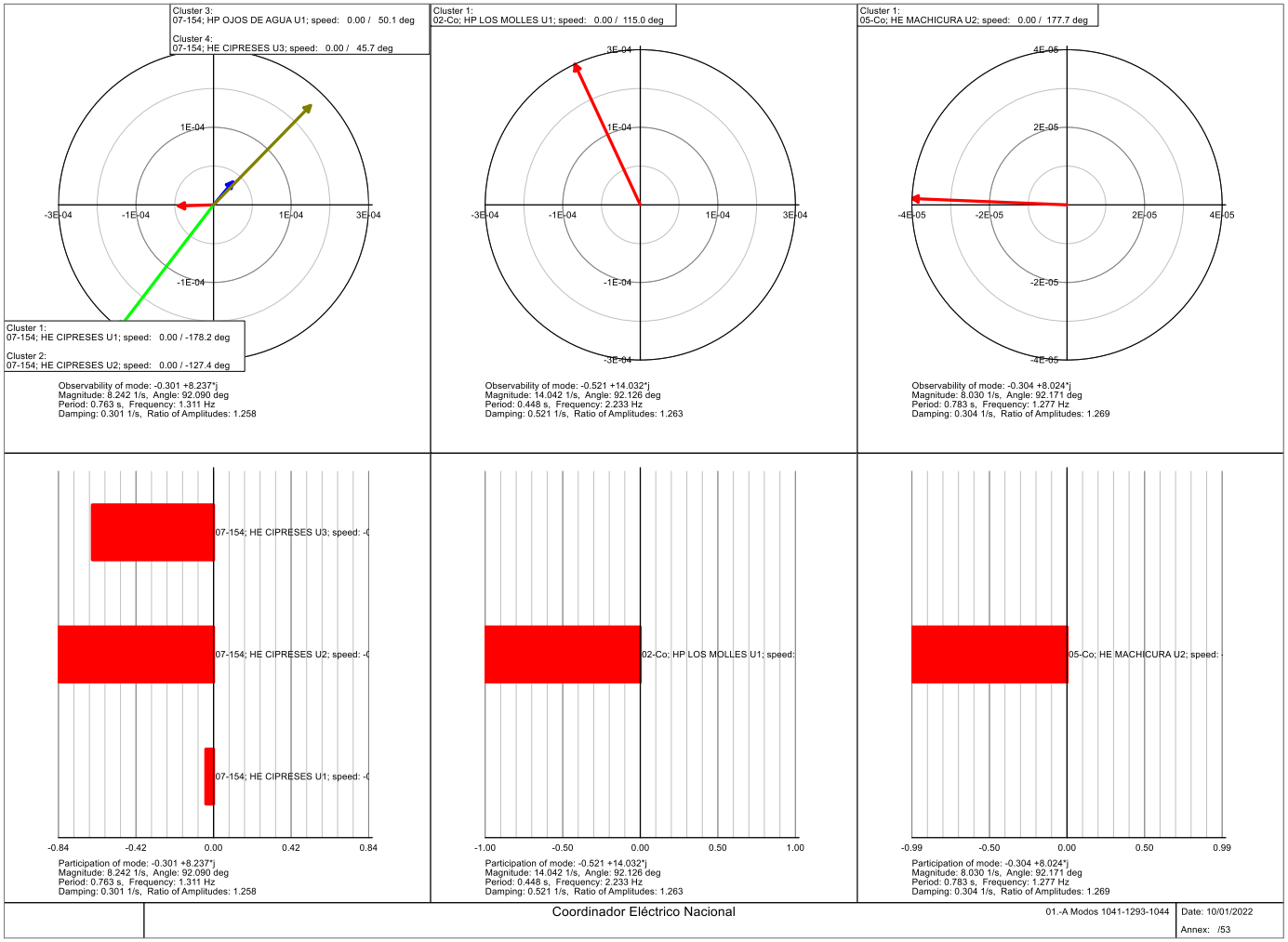


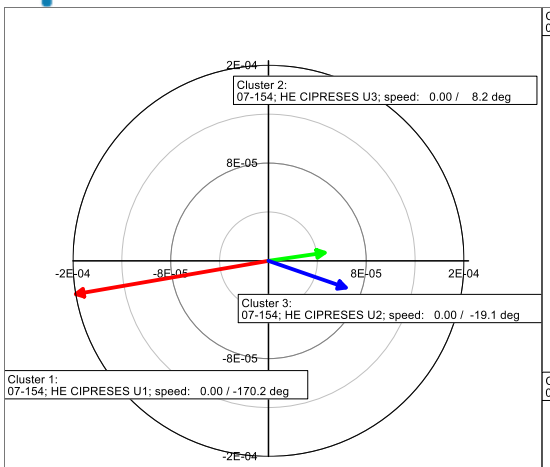
14.3.4 Red N-1 Caso 3.- Charrúa - Ancoa 500 kV



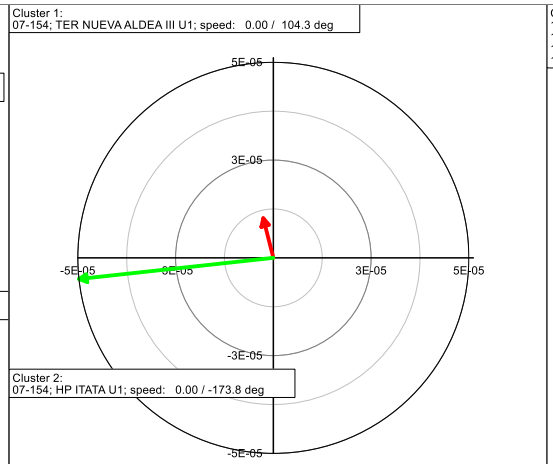
14.4 Escenario E4 DA noche Mar2022

14.4.1 Red N

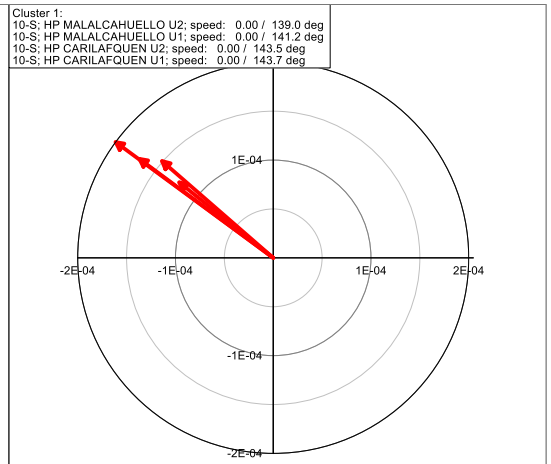




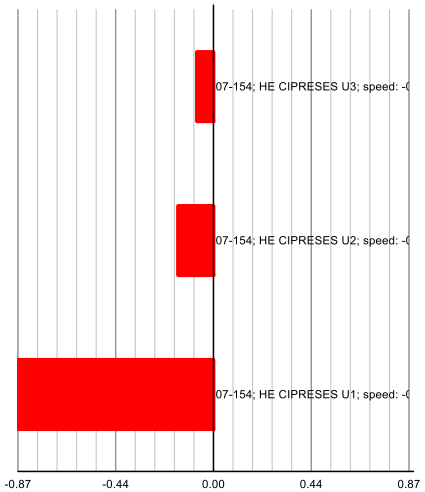
Observability of mode: -0.351 +8.563*j
Magnitude: 8.570 1/s, Angle: 92.345 deg
Period: 0.734 s, Frequency: 1.363 Hz
Damping: 0.351 1/s, Ratio of Amplitudes: 1.294



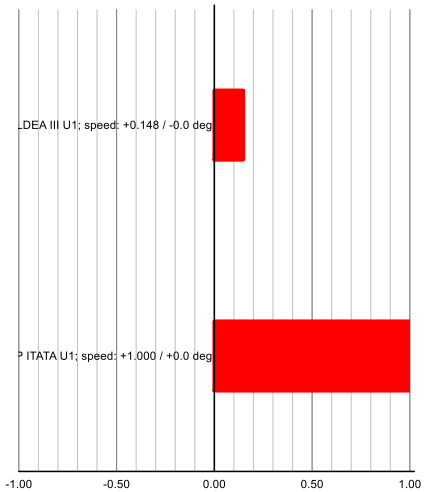
Observability of mode: -0.305 +6.393*j
Magnitude: 6.400 1/s, Angle: 92.736 deg
Period: 0.983 s, Frequency: 1.017 Hz
Damping: 0.305 1/s, Ratio of Amplitudes: 1.350



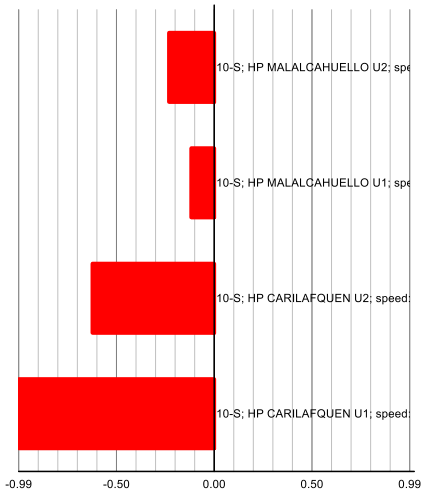
Observability of mode: -0.638 +10.302*j
Magnitude: 10.322 1/s, Angle: 93.543 deg
Period: 0.610 s, Frequency: 1.640 Hz
Damping: 0.638 1/s, Ratio of Amplitudes: 1.476



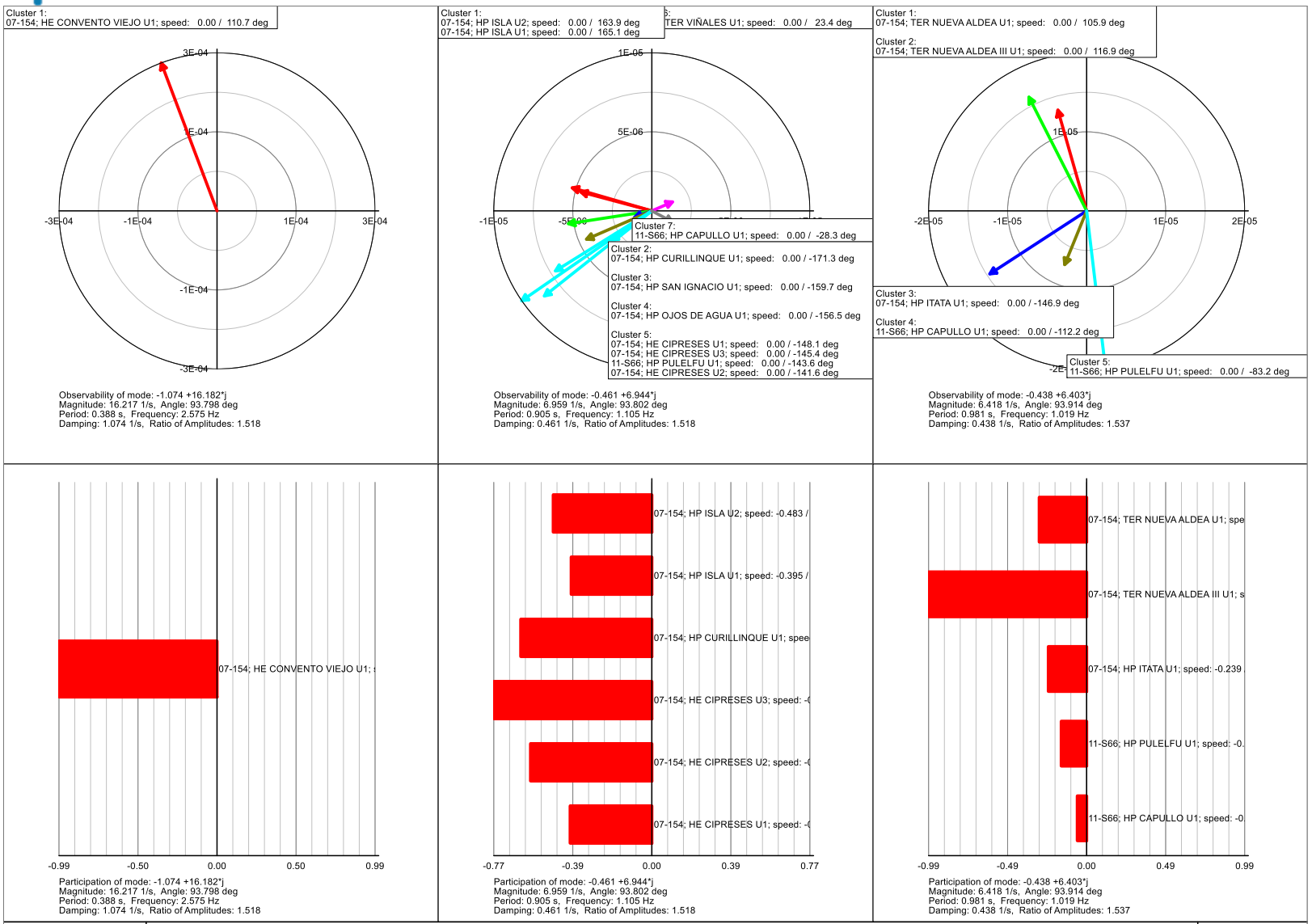
Participation of mode: -0.351 +8.563*j
Magnitude: 8.570 1/s, Angle: 92.345 deg
Period: 0.734 s, Frequency: 1.363 Hz
Damping: 0.351 1/s, Ratio of Amplitudes: 1.294



Participation of mode: -0.305 +6.393*j
Magnitude: 6.400 1/s, Angle: 92.736 deg
Period: 0.983 s, Frequency: 1.017 Hz
Damping: 0.305 1/s, Ratio of Amplitudes: 1.350



Participation of mode: -0.638 +10.302*j
Magnitude: 10.322 1/s, Angle: 93.543 deg
Period: 0.610 s, Frequency: 1.640 Hz
Damping: 0.638 1/s, Ratio of Amplitudes: 1.476

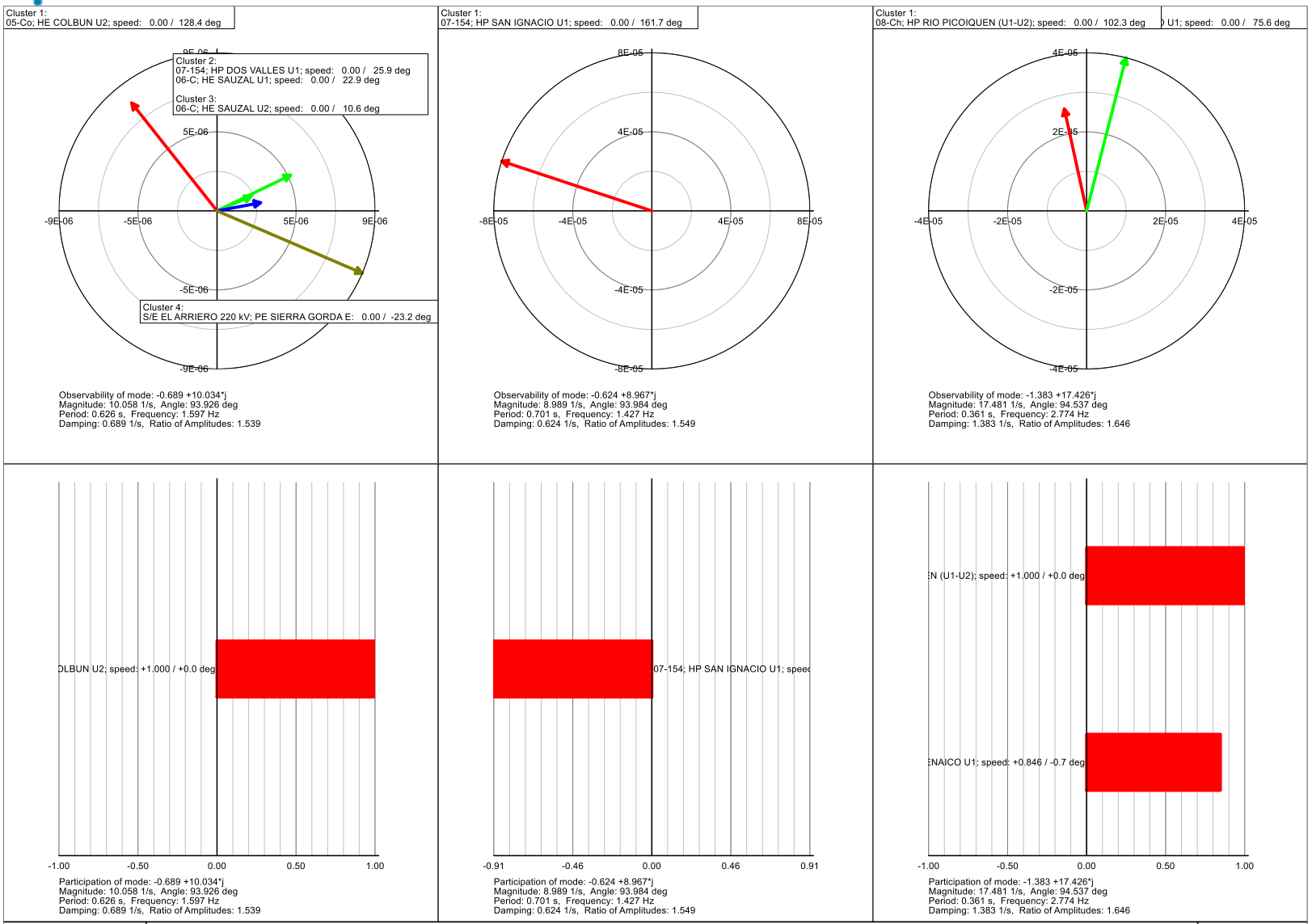


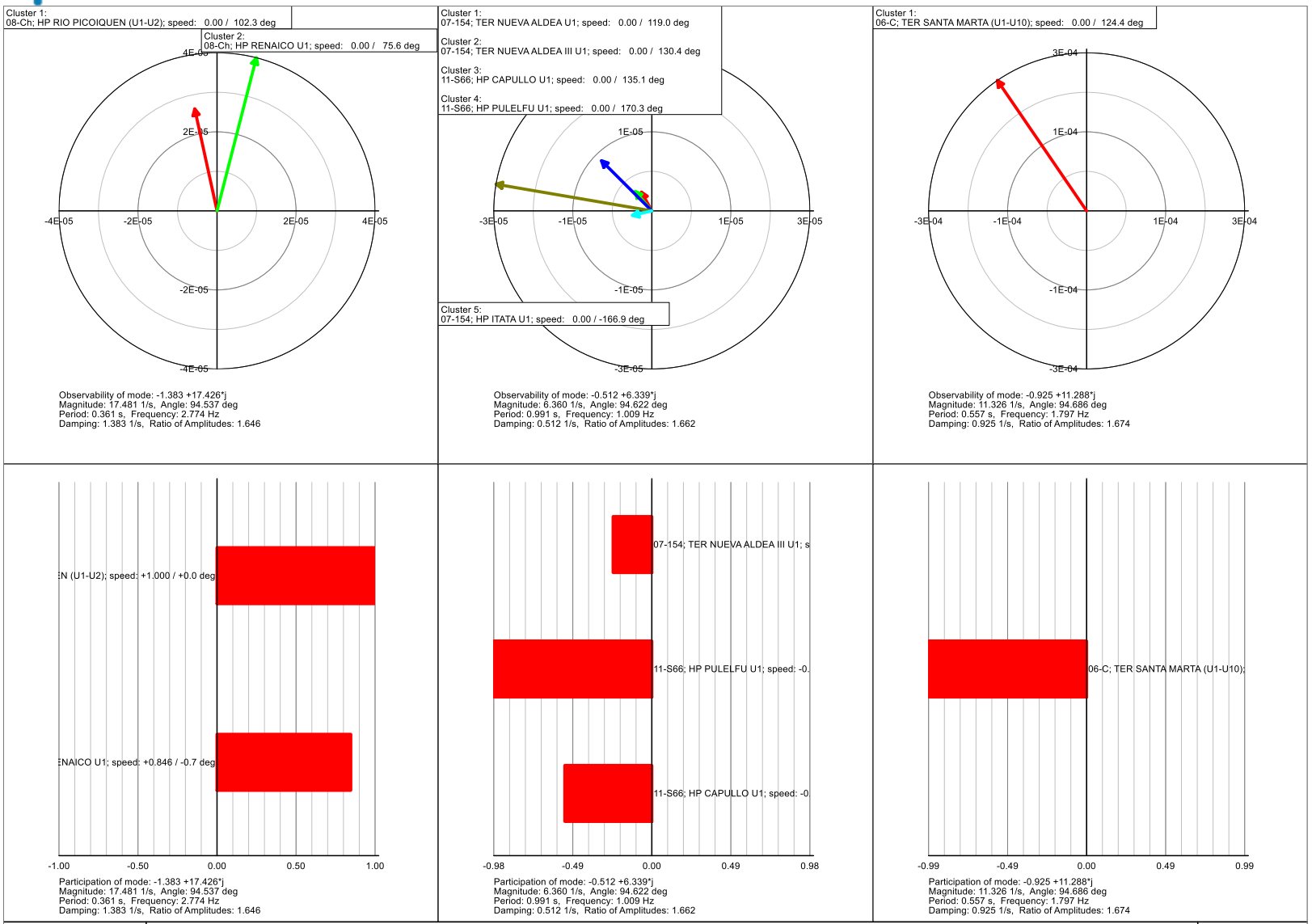
Coordinador Eléctrico Nacional

03.-A Modos 1662-1156-1132

Date: 10/01/2022

Annex: /56


Cluster 1:
05-Co; HE COLBUN U2; speed: 0.00 / 128.4 deg
Cluster 2:
07-154; HP DOS VALLES U1; speed: 0.00 / 25.9 deg
06-C; HE SAUZAL U1; speed: 0.00 / 22.9 deg
Cluster 3:
06-C; HE SAUZAL U2; speed: 0.00 / 10.6 deg
Cluster 4:
S/E EL ARRIERO 220 kV; PE SIERRA GORDA E: 0.00 / -23.2 deg
Observability of mode: -0.689 +10.034*j
Magnitude: 10.058 1/s, Angle: 93.926 deg
Period: 0.626 s, Frequency: 1.597 Hz
Damping: 0.689 1/s, Ratio of Amplitudes: 1.539
Cluster 1:
07-154; HP SAN IGNACIO U1; speed: 0.00 / 161.7 deg
Observability of mode: -0.624 +8.967*j
Magnitude: 8.989 1/s, Angle: 93.984 deg
Period: 0.701 s, Frequency: 1.427 Hz
Damping: 0.624 1/s, Ratio of Amplitudes: 1.549
Cluster 1:
08-Ch; HP RIO PICOIQUEN (U1-U2); speed: 0.00 / 102.3 deg
U1; speed: 0.00 / 75.6 deg
Observability of mode: -1.383 +17.426*j
Magnitude: 17.481 1/s, Angle: 94.537 deg
Period: 0.361 s, Frequency: 2.774 Hz
Damping: 1.383 1/s, Ratio of Amplitudes: 1.646
OLBUN U2; speed: +1.000 / +0.0 deg
Participation of mode: -0.689 +10.034*j
Magnitude: 10.058 1/s, Angle: 93.926 deg
Period: 0.626 s, Frequency: 1.597 Hz
Damping: 0.689 1/s, Ratio of Amplitudes: 1.539
07-154; HP SAN IGNACIO U1; speed
Participation of mode: -0.624 +8.967*j
Magnitude: 8.989 1/s, Angle: 93.984 deg
Period: 0.701 s, Frequency: 1.427 Hz
Damping: 0.624 1/s, Ratio of Amplitudes: 1.549
N (U1-U2); speed: +1.000 / +0.0 deg
NAICO U1; speed: +0.846 / -0.7 deg
Participation of mode: -1.383 +17.426*j
Magnitude: 17.481 1/s, Angle: 94.537 deg
Period: 0.361 s, Frequency: 2.774 Hz
Damping: 1.383 1/s, Ratio of Amplitudes: 1.646

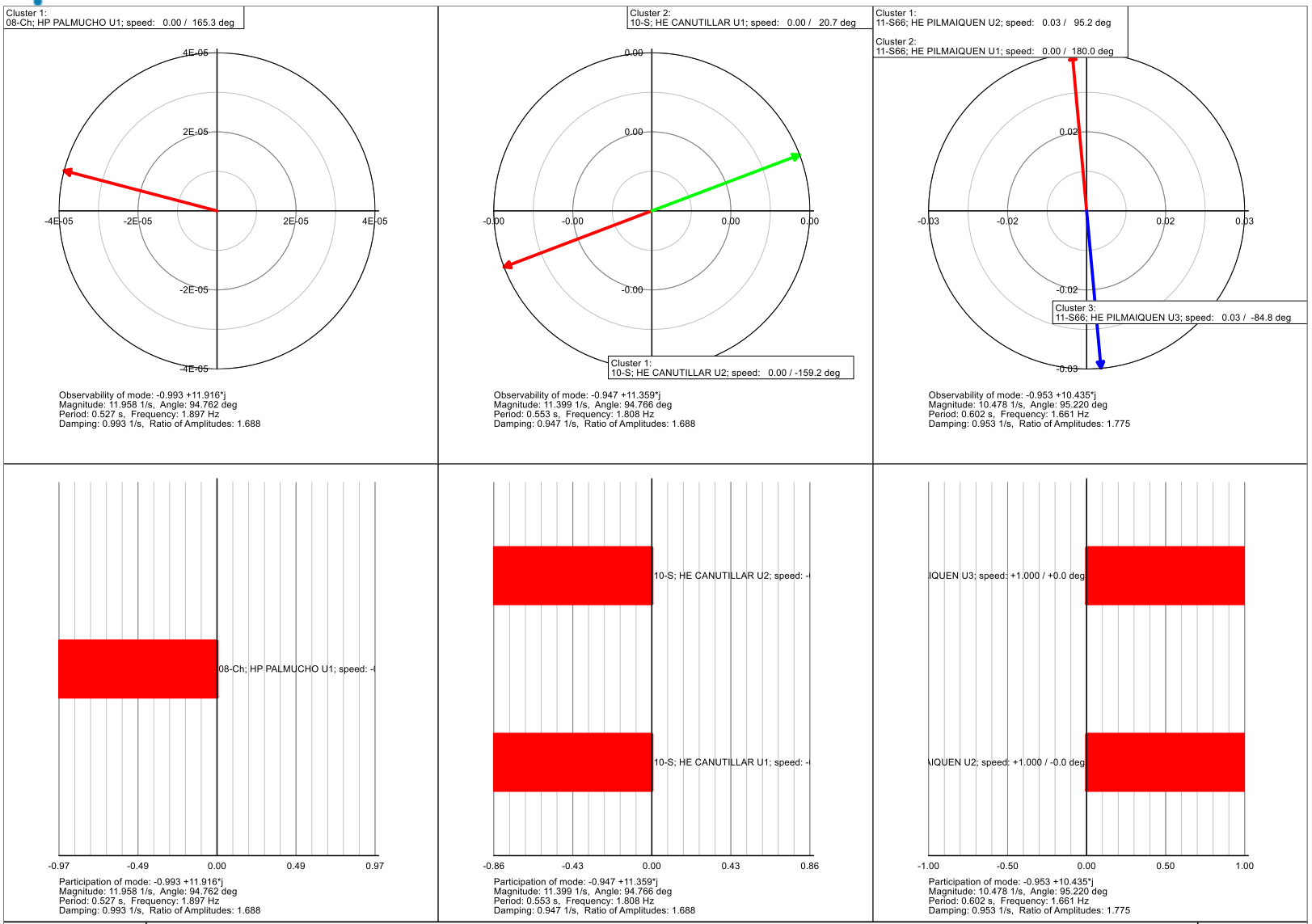


Coordinador Eléctrico Nacional

05.-A Modos 1772-1291-1469

Date: 10/01/2022

Annex: /60

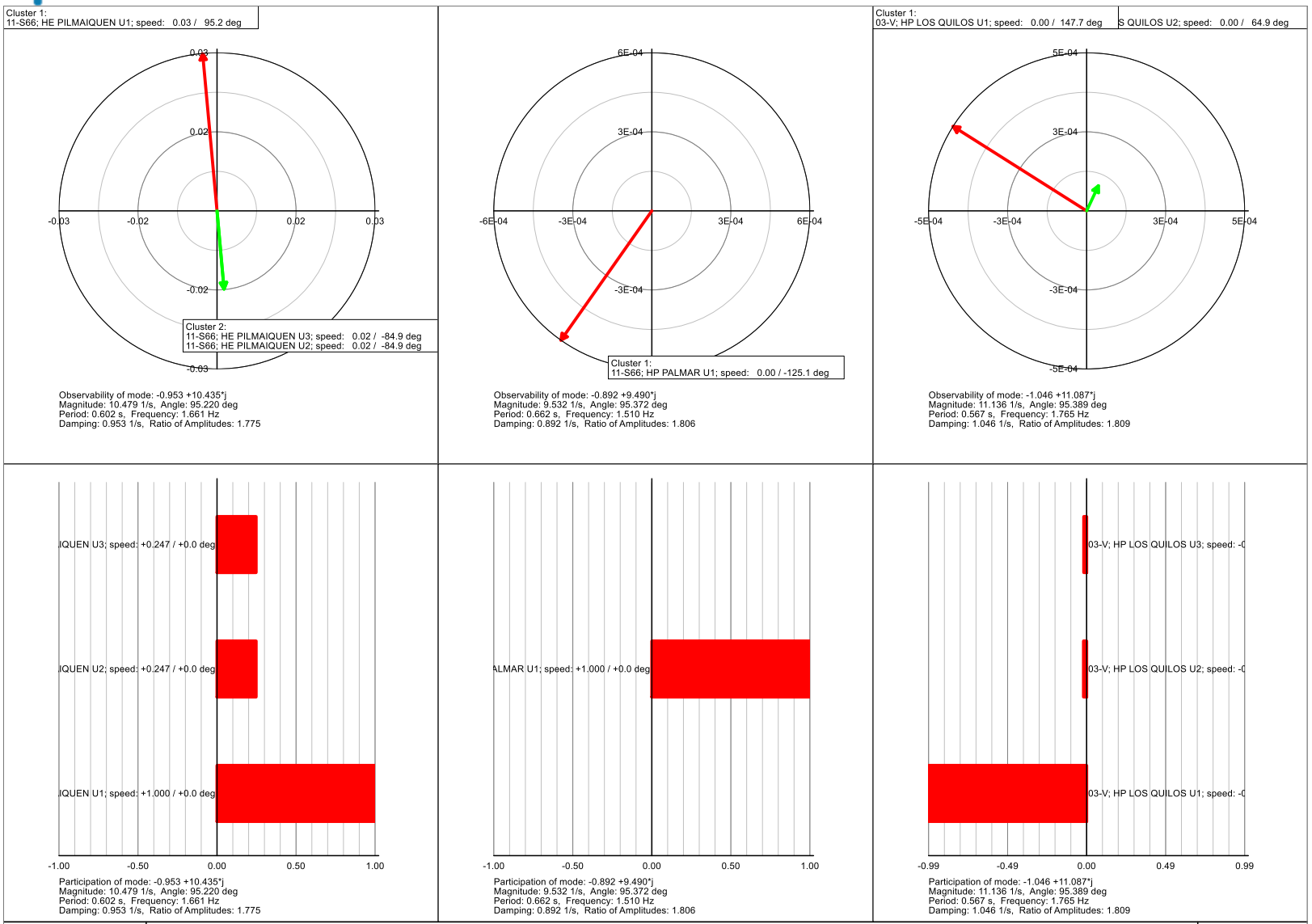


Coordinador Eléctrico Nacional

06.-A Modos 1505-1476-1482

Date: 10/01/2022

Annex: /61

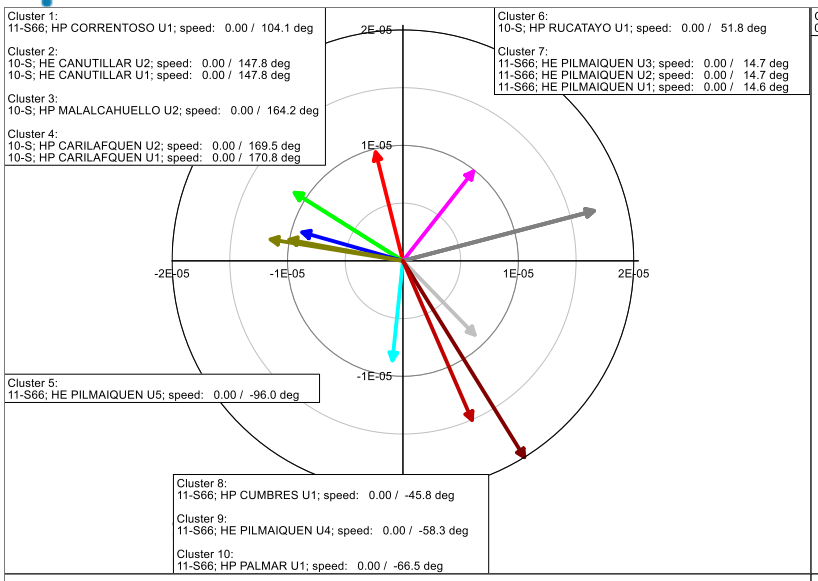


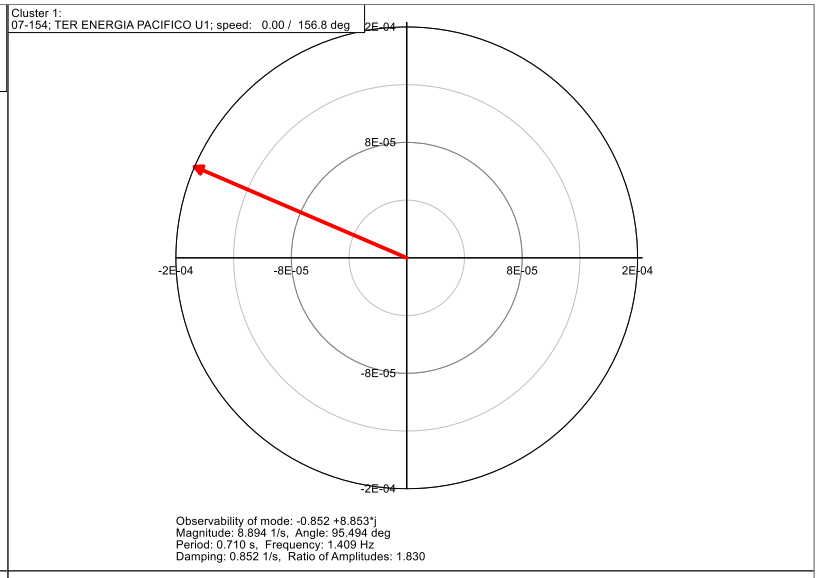
Coordinador Eléctrico Nacional

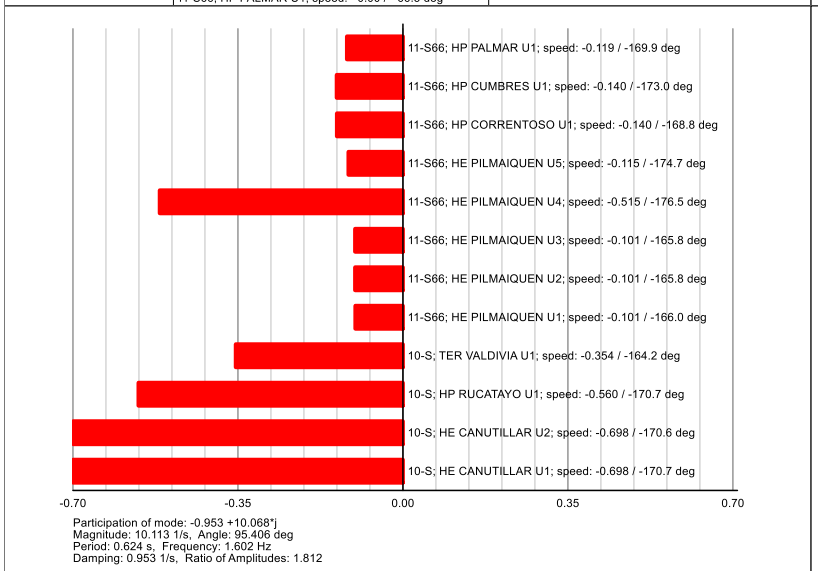
07.-A Modos 1484-1456-1648

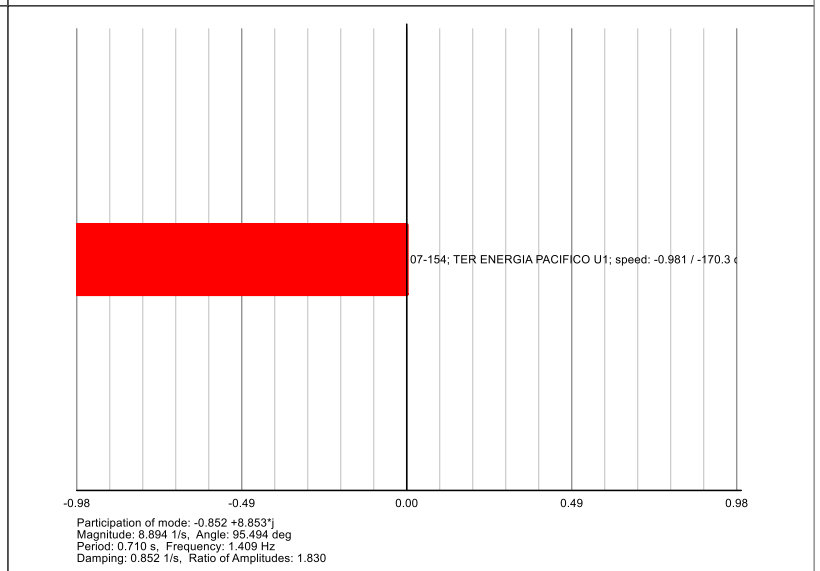
Date: 10/01/2022

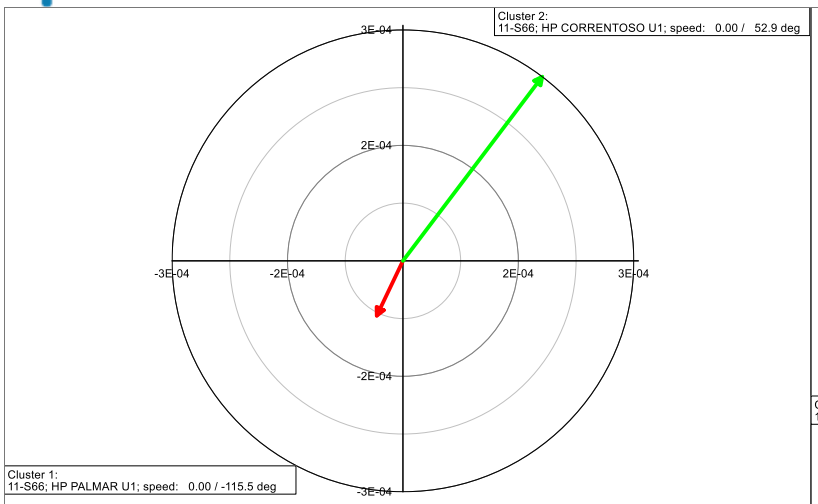
Annex: /62


Cluster 1:
11-S66; HP CORRENTOSO U1; speed: 0.00 / 104.1 deg
Cluster 2:
10-S; HE CANUTILLAR U2; speed: 0.00 / 147.8 deg
10-S; HE CANUTILLAR U1; speed: 0.00 / 147.8 deg
Cluster 3:
10-S; HP MALALCAHUELLO U2; speed: 0.00 / 164.2 deg
Cluster 4:
10-S; HP CARILAFQUEN U2; speed: 0.00 / 169.5 deg
10-S; HP CARILAFQUEN U1; speed: 0.00 / 170.8 deg
Cluster 6:
10-S; HP RUCATAYO U1; speed: 0.00 / 51.8 deg
Cluster 7:
11-S66; HE PILMAIQUEN U3; speed: 0.00 / 14.7 deg
11-S66; HE PILMAIQUEN U2; speed: 0.00 / 14.7 deg
11-S66; HE PILMAIQUEN U1; speed: 0.00 / 14.6 deg
Cluster 5:
11-S66; HE PILMAIQUEN U5; speed: 0.00 / -96.0 deg
Cluster 8:
11-S66; HP CUMBRES U1; speed: 0.00 / -45.8 deg
Cluster 9:
11-S66; HE PILMAIQUEN U4; speed: 0.00 / -58.3 deg
Cluster 10:
11-S66; HP PALMAR U1; speed: 0.00 / -66.5 deg
2E-05
1E-05
-1E-05
-2E-05
-1E-05
1E-05
2E-05

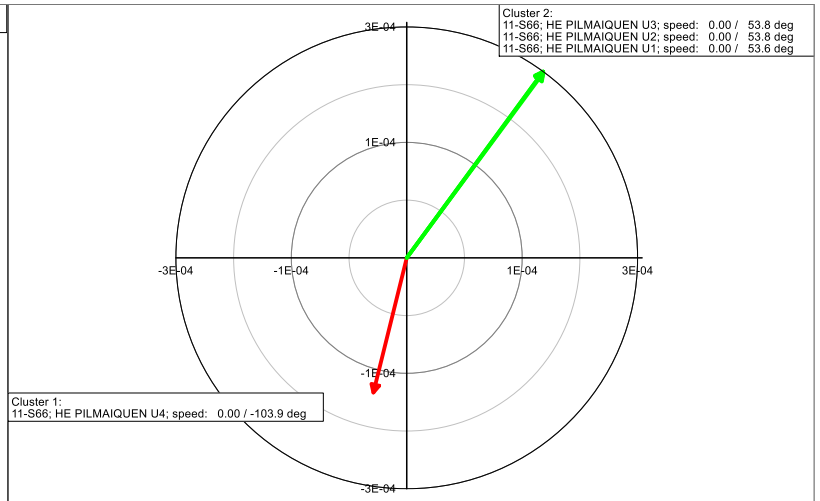

Cluster 1:
07-154; TER ENERGIA PACIFICO U1; speed: 0.00 / 156.8 deg
2E-04
8E-05
-8E-05
-2E-04
-2E-04
-8E-05
8E-05
2E-04
Observability of mode: -0.852 +8.853*j
Magnitude: 8.894 1/s, Angle: 95.494 deg
Period: 0.710 s, Frequency: 1.409 Hz
Damping: 0.852 1/s, Ratio of Amplitudes: 1.830


11-S66; HP PALMAR U1; speed: -0.119 / -169.9 deg
11-S66; HP CUMBRES U1; speed: -0.140 / -173.0 deg
11-S66; HP CORRENTOSO U1; speed: -0.140 / -168.8 deg
11-S66; HE PILMAIQUEN U5; speed: -0.115 / -174.7 deg
11-S66; HE PILMAIQUEN U4; speed: -0.515 / -176.5 deg
11-S66; HE PILMAIQUEN U3; speed: -0.101 / -165.8 deg
11-S66; HE PILMAIQUEN U2; speed: -0.101 / -165.8 deg
11-S66; HE PILMAIQUEN U1; speed: -0.101 / -166.0 deg
10-S; TER VALDIVIA U1; speed: -0.354 / -164.2 deg
10-S; HP RUCATAYO U1; speed: -0.560 / -170.7 deg
10-S; HE CANUTILLAR U2; speed: -0.698 / -170.6 deg
10-S; HE CANUTILLAR U1; speed: -0.698 / -170.7 deg
-0.70
-0.35
0.00
0.35
0.70
Participation of mode: -0.953 +10.068*j
Magnitude: 10.113 1/s, Angle: 95.406 deg
Period: 0.624 s, Frequency: 1.602 Hz
Damping: 0.953 1/s, Ratio of Amplitudes: 1.812

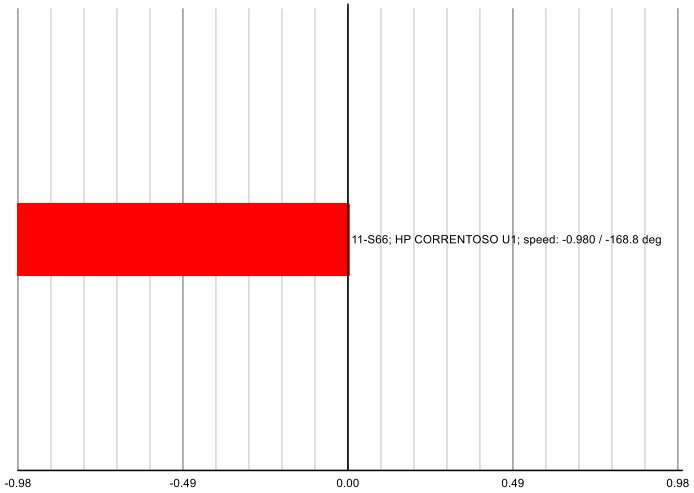

07-154; TER ENERGIA PACIFICO U1; speed: -0.981 / -170.3
-0.98
-0.49
0.00
0.49
0.98
Participation of mode: -0.852 +8.853*j
Magnitude: 8.894 1/s, Angle: 95.494 deg
Period: 0.710 s, Frequency: 1.409 Hz
Damping: 0.852 1/s, Ratio of Amplitudes: 1.830



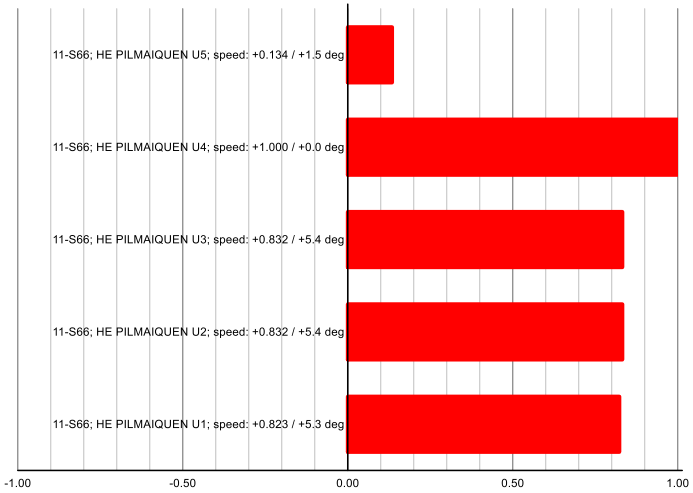
Observability of mode: -1.056 +10.644*j
Magnitude: 10.696 1/s, Angle: 95.668 deg
Period: 0.590 s, Frequency: 1.694 Hz
Damping: 1.056 1/s, Ratio of Amplitudes: 1.866



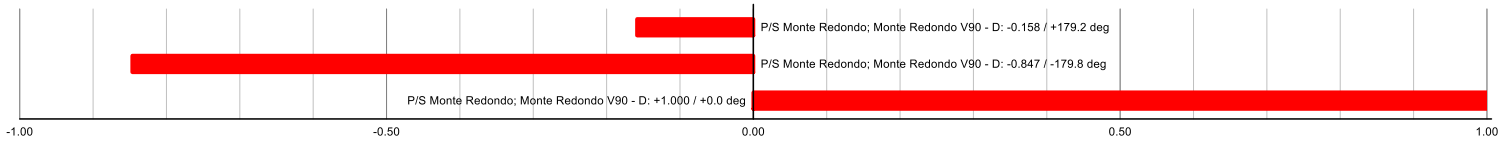
Observability of mode: -1.028 +10.312*j
Magnitude: 10.363 1/s, Angle: 95.694 deg
Period: 0.609 s, Frequency: 1.641 Hz
Damping: 1.028 1/s, Ratio of Amplitudes: 1.871



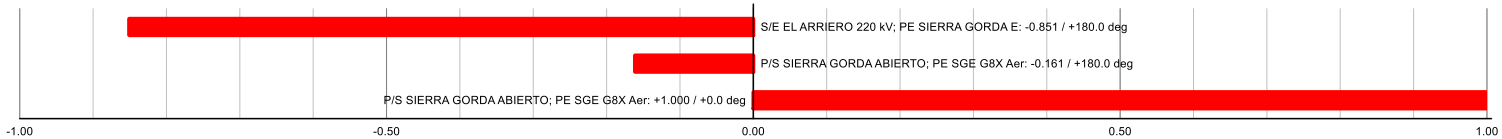
Participation of mode: -1.056 +10.644*j
Magnitude: 10.696 1/s, Angle: 95.668 deg
Period: 0.590 s, Frequency: 1.694 Hz
Damping: 1.056 1/s, Ratio of Amplitudes: 1.866



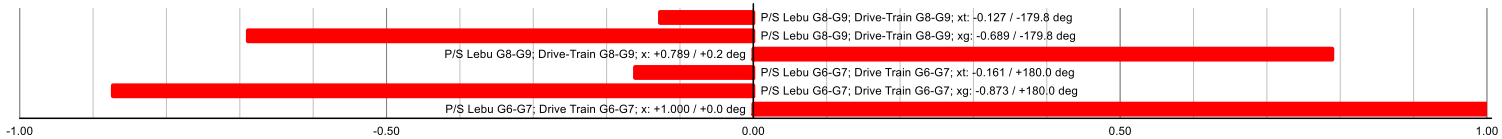
Participation of mode: -1.028 +10.312*j
Magnitude: 10.363 1/s, Angle: 95.694 deg
Period: 0.609 s, Frequency: 1.641 Hz
Damping: 1.028 1/s, Ratio of Amplitudes: 1.871



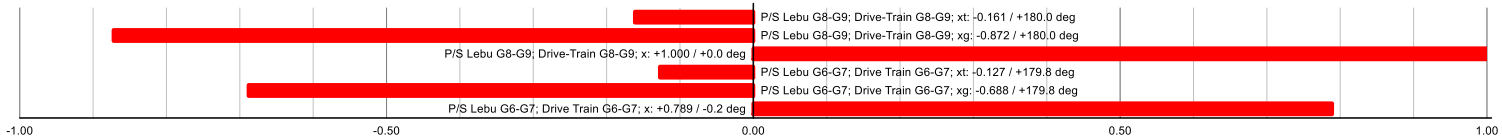
Participation of mode: -0.331 +9.753*j
Magnitude: 9.759 1/s, Angle: 91.944 deg
Period: 0.644 s, Frequency: 1.552 Hz
Damping: 0.331 1/s, Ratio of Amplitudes: 1.238
Min. contribution: 0.100



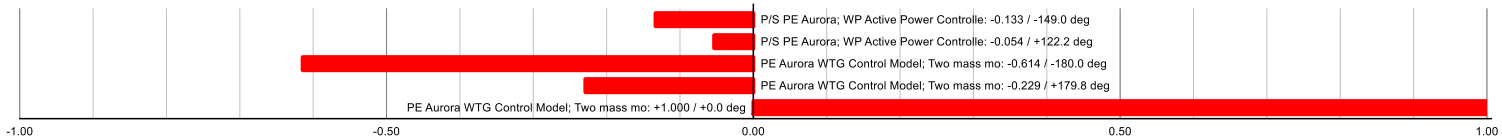
Participation of mode: -0.605 +9.778*j
Magnitude: 9.796 1/s, Angle: 93.541 deg
Period: 0.643 s, Frequency: 1.556 Hz
Damping: 0.605 1/s, Ratio of Amplitudes: 1.475
Min. contribution: 0.100



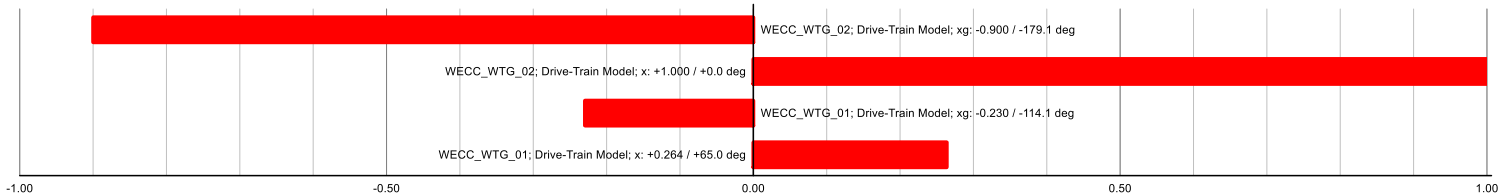
Participation of mode: -0.710 +11.106*j
Magnitude: 11.129 1/s, Angle: 93.660 deg
Period: 0.566 s, Frequency: 1.768 Hz
Damping: 0.710 1/s, Ratio of Amplitudes: 1.495
Min. contribution: 0.100



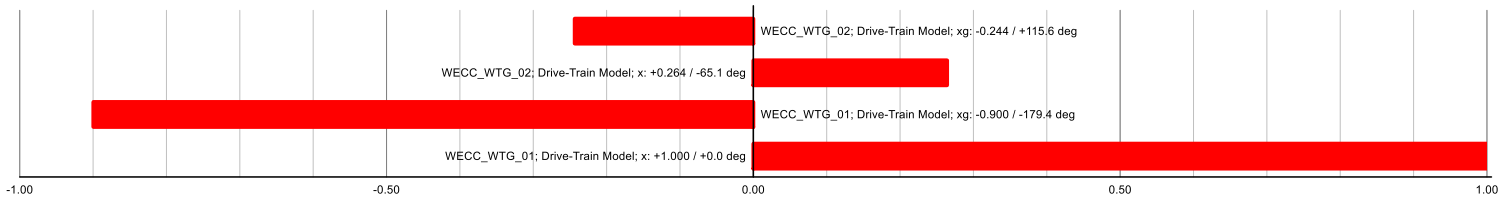
Participation of mode: -0.713 +11.101*j
Magnitude: 11.124 1/s, Angle: 93.676 deg
Period: 0.566 s, Frequency: 1.767 Hz
Damping: 0.713 1/s, Ratio of Amplitudes: 1.497
Min. contribution: 0.100



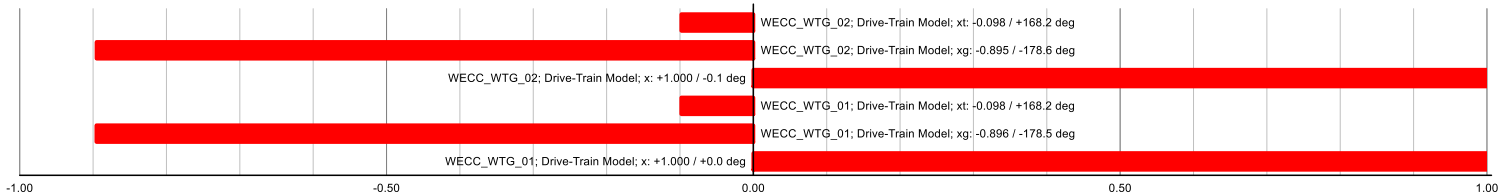
Participation of mode: -0.564 +8.163*j
Magnitude: 8.182 1/s, Angle: 93.952 deg
Period: 0.770 s, Frequency: 1.299 Hz
Damping: 0.564 1/s, Ratio of Amplitudes: 1.543
Min. contribution: 0.100



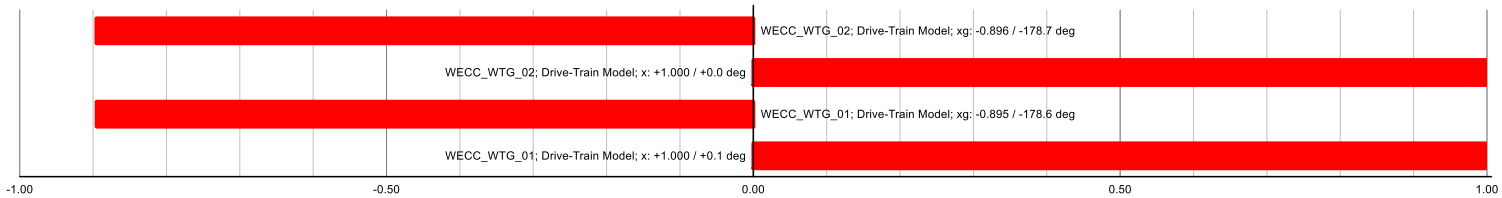
Participation of mode: -0.451 +5.317*j
Magnitude: 5.336 1/s, Angle: 94.848 deg
Period: 1.182 s, Frequency: 0.846 Hz
Damping: 0.451 1/s, Ratio of Amplitudes: 1.704
Min. contribution: 0.100



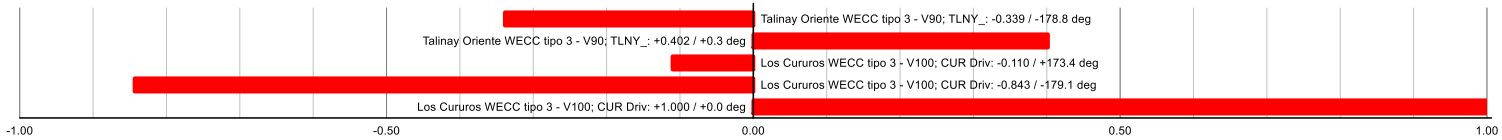
Participation of mode: -0.459 +5.305*j
Magnitude: 5.325 1/s, Angle: 94.946 deg
Period: 1.184 s, Frequency: 0.844 Hz
Damping: 0.459 1/s, Ratio of Amplitudes: 1.722
Min. contribution: 0.100



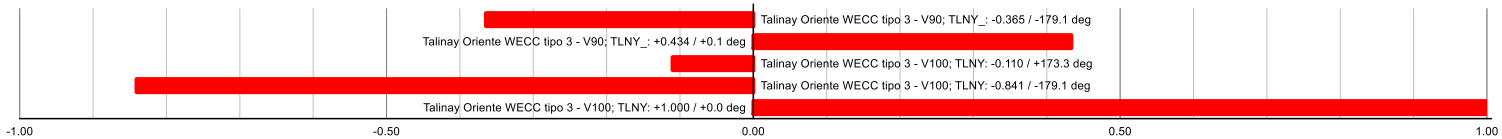
Participation of mode: -0.911 +9.912*j
Magnitude: 9.954 1/s, Angle: 95.253 deg
Period: 0.634 s, Frequency: 1.578 Hz
Damping: 0.911 1/s, Ratio of Amplitudes: 1.782
Min. contribution: 0.100



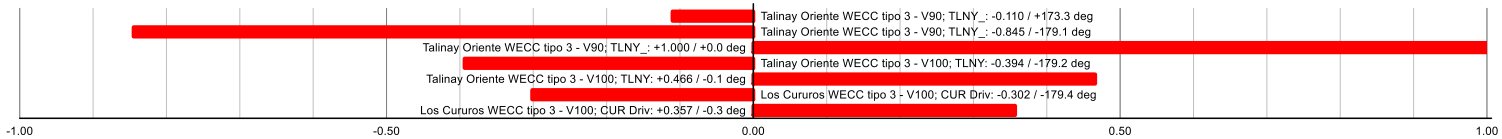
Participation of mode: -0.922 +9.908*j
Magnitude: 9.951 1/s, Angle: 95.315 deg
Period: 0.634 s, Frequency: 1.577 Hz
Damping: 0.922 1/s, Ratio of Amplitudes: 1.794
Min. contribution: 0.100



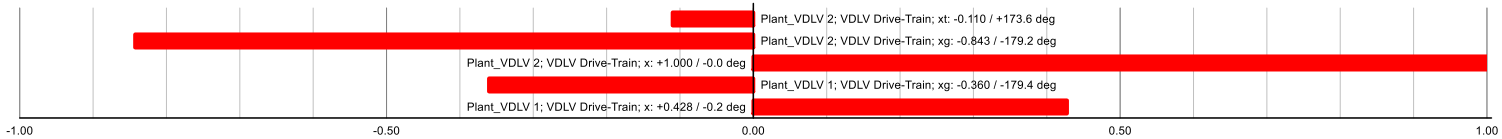
Participation of mode: -1.146 +12.268*j
Magnitude: 12.322 1/s, Angle: 95.337 deg
Period: 0.512 s, Frequency: 1.953 Hz
Damping: 1.146 1/s, Ratio of Amplitudes: 1.798
Min. contribution: 0.100



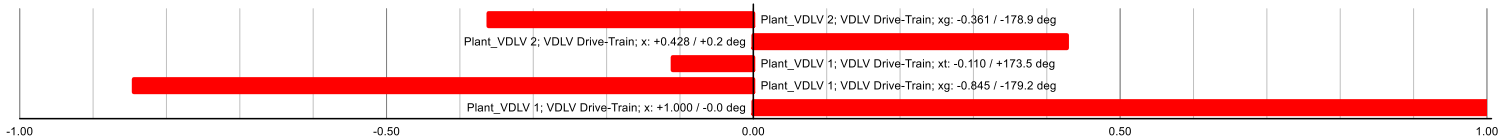
Participation of mode: -1.154 +12.251*j
Magnitude: 12.306 1/s, Angle: 95.383 deg
Period: 0.513 s, Frequency: 1.950 Hz
Damping: 1.154 1/s, Ratio of Amplitudes: 1.808
Min. contribution: 0.100



Participation of mode: -1.158 +12.276*j
Magnitude: 12.331 1/s, Angle: 95.388 deg
Period: 0.512 s, Frequency: 1.954 Hz
Damping: 1.158 1/s, Ratio of Amplitudes: 1.809
Min. contribution: 0.100

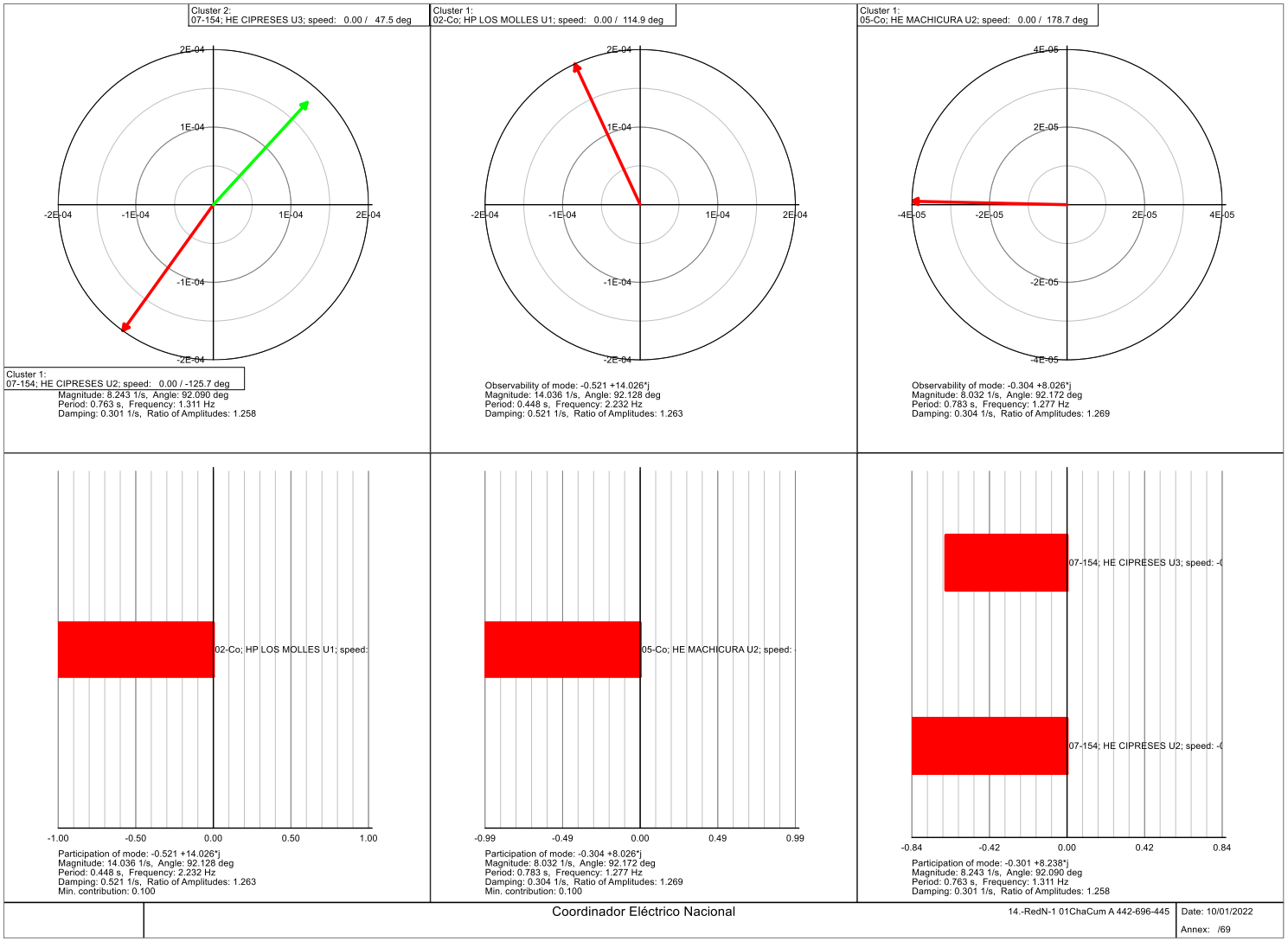


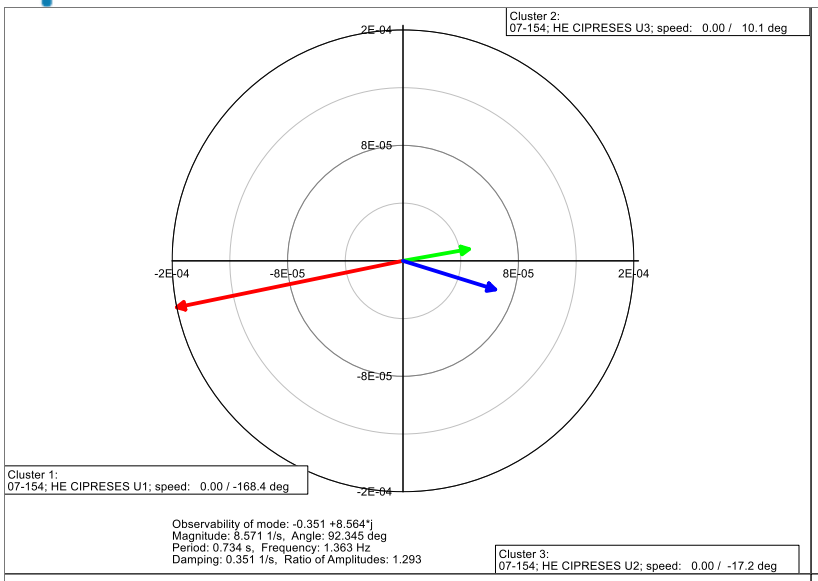
Participation of mode: -1.166 +12.261*j
Magnitude: 12.316 1/s, Angle: 95.432 deg
Period: 0.512 s, Frequency: 1.951 Hz
Damping: 1.166 1/s, Ratio of Amplitudes: 1.818
Min. contribution: 0.100



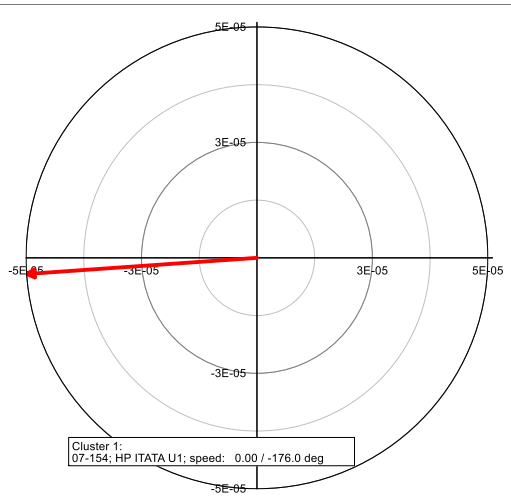
Participation of mode: -1.176 +12.273*j
Magnitude: 12.329 1/s, Angle: 95.471 deg
Period: 0.512 s, Frequency: 1.953 Hz
Damping: 1.176 1/s, Ratio of Amplitudes: 1.825
Min. contribution: 0.100

14.4.2 Red N-1 Caso 1.- Changos Cumbres 500 kV

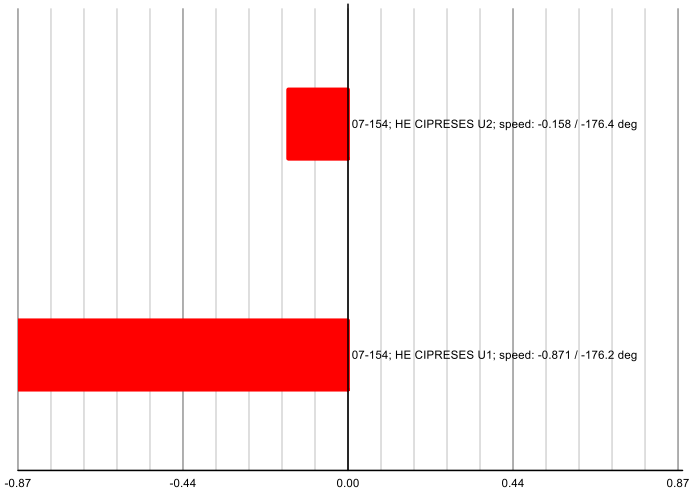




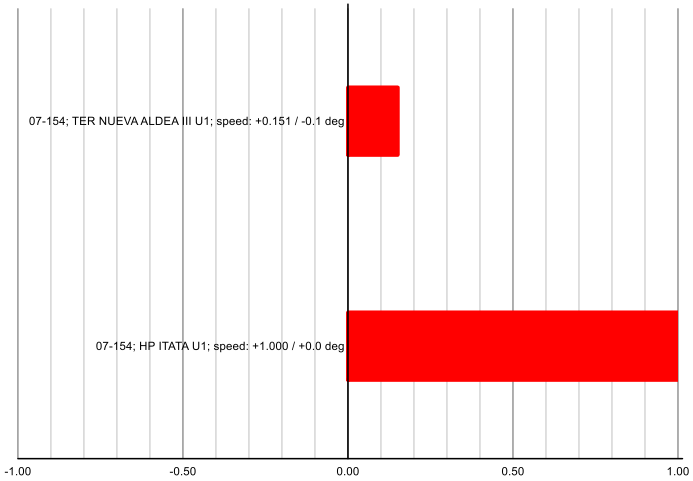
Observability of mode: -0.351 +8.564*j
Magnitude: 8.571 1/s, Angle: 92.345 deg
Period: 0.734 s, Frequency: 1.363 Hz
Damping: 0.351 1/s, Ratio of Amplitudes: 1.293



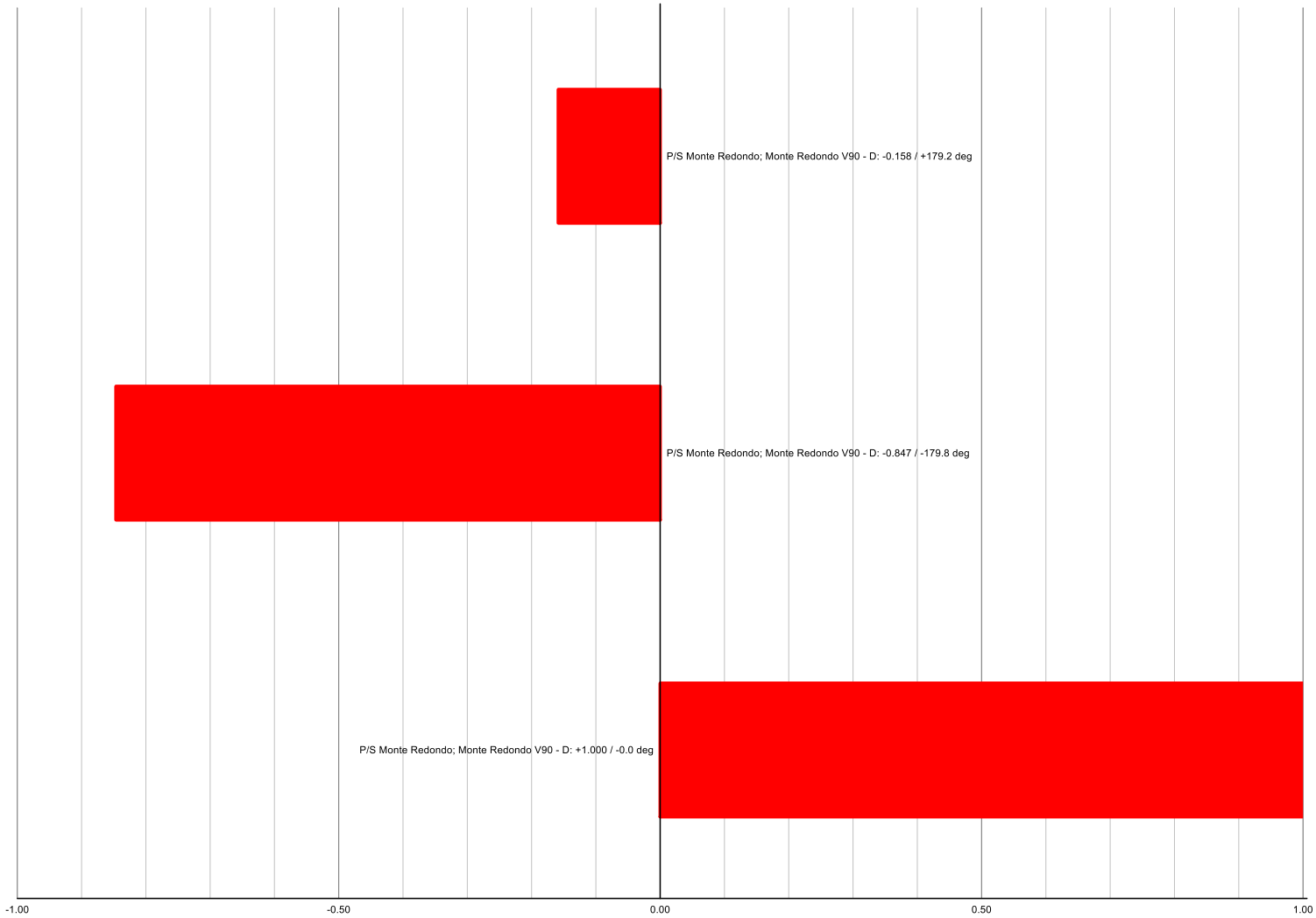
Observability of mode: -0.306 +6.391*j
Magnitude: 6.399 1/s, Angle: 92.738 deg
Period: 0.983 s, Frequency: 1.017 Hz
Damping: 0.306 1/s, Ratio of Amplitudes: 1.350



Participation of mode: -0.351 +8.564*j
Magnitude: 8.571 1/s, Angle: 92.345 deg
Period: 0.734 s, Frequency: 1.363 Hz
Damping: 0.351 1/s, Ratio of Amplitudes: 1.293

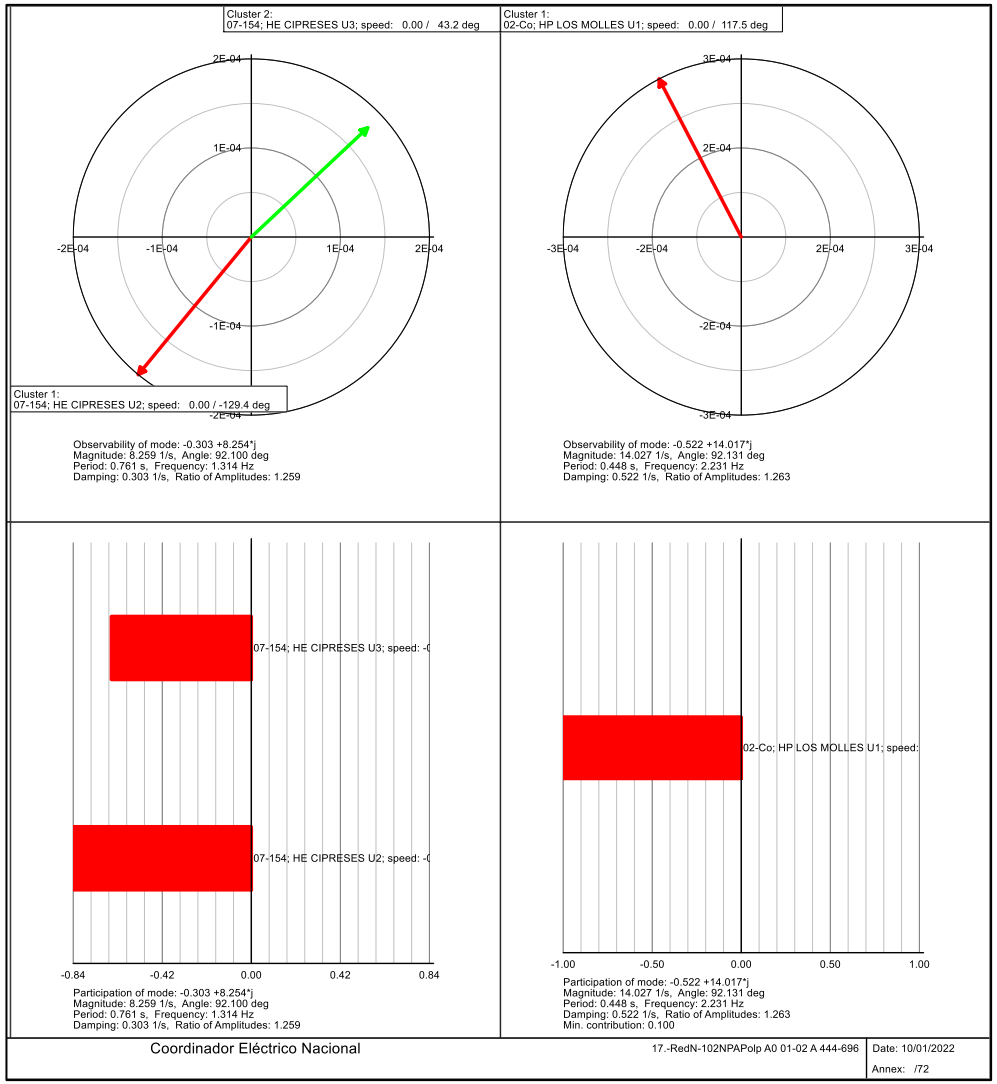


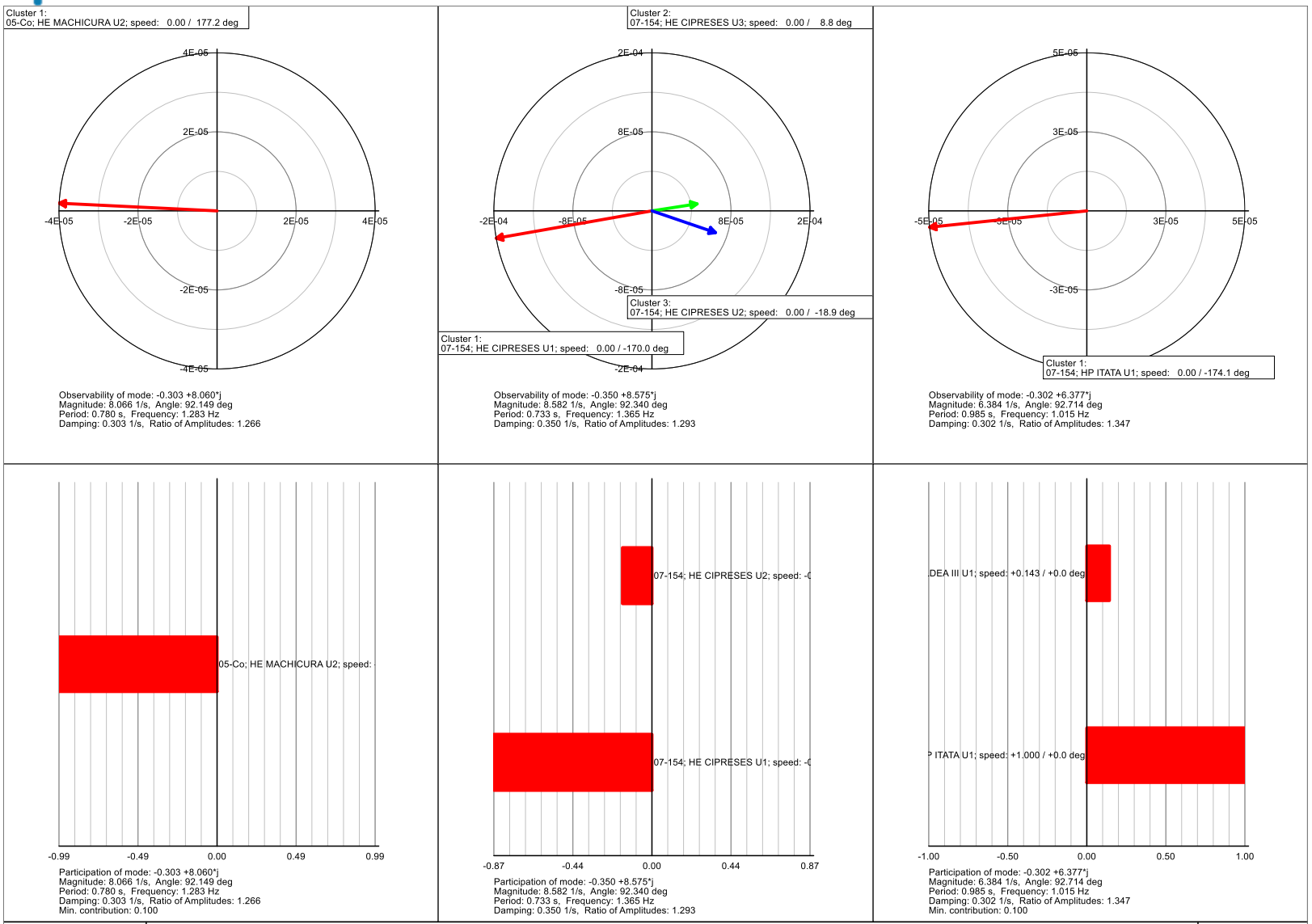
Participation of mode: -0.306 +6.391*j
Magnitude: 6.399 1/s, Angle: 92.738 deg
Period: 0.983 s, Frequency: 1.017 Hz
Damping: 0.306 1/s, Ratio of Amplitudes: 1.350
Min. contribution: 0.100



Participation of mode: -0.331 +9.753*j
Magnitude: 9.759 1/s, Angle: 91.944 deg
Period: 0.644 s, Frequency: 1.552 Hz
Damping: 0.331 1/s, Ratio of Amplitudes: 1.238
Min. contribution: 0.100

14.4.3 Red N-1 Caso 2.- Nueva Pan de Azúcar - Polpaico 500 kV





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18.-RedN-102NPAPolp Modos A 442-489-440

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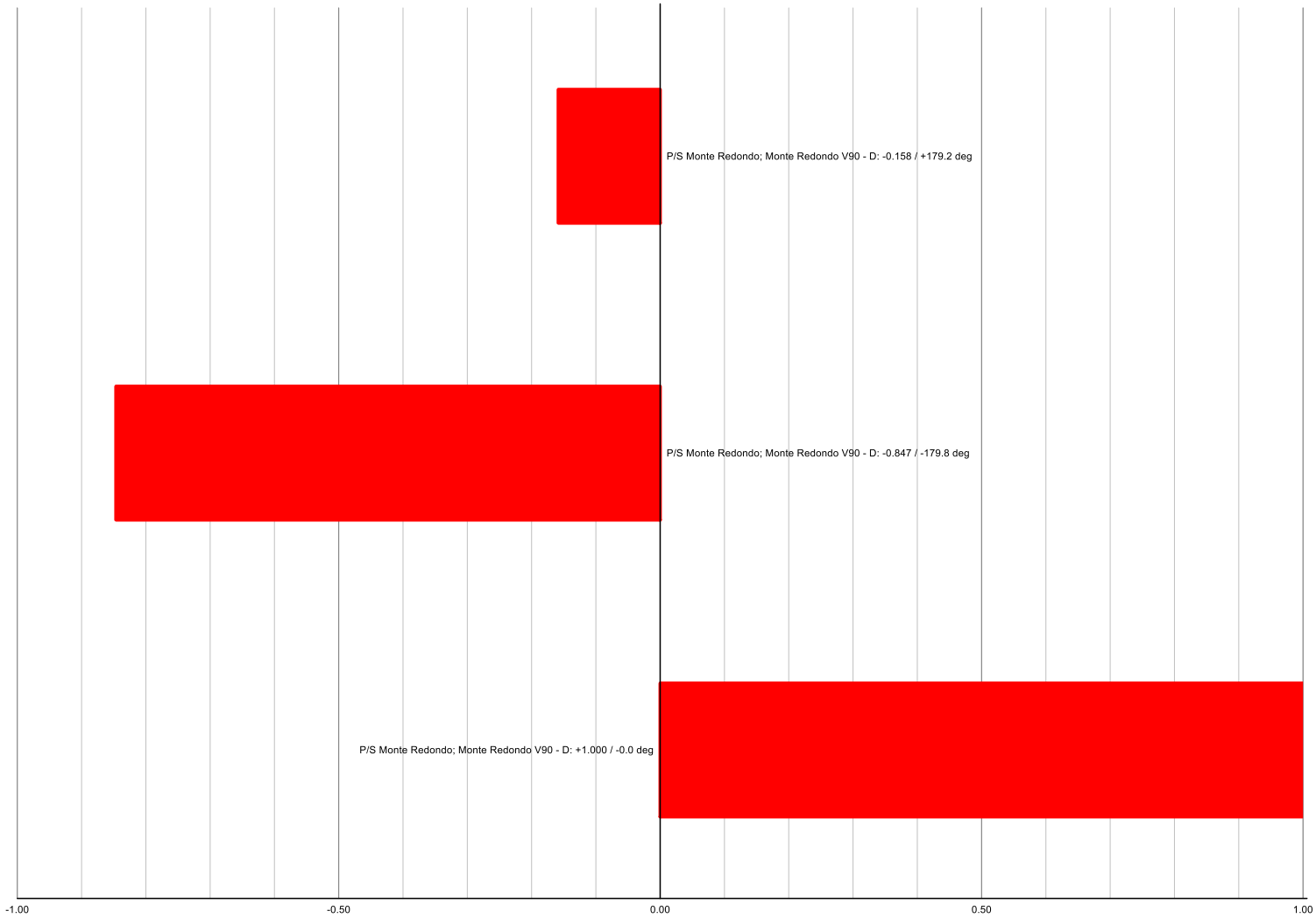
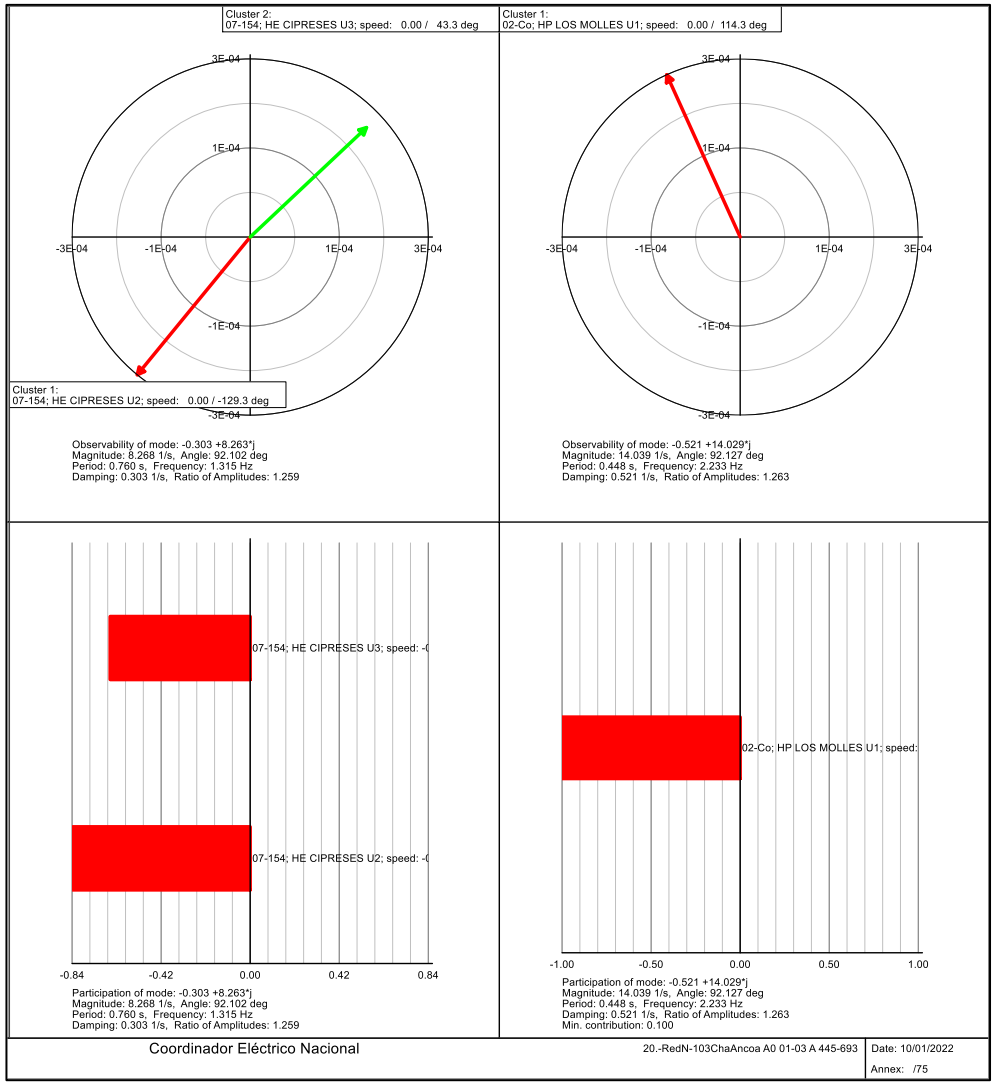
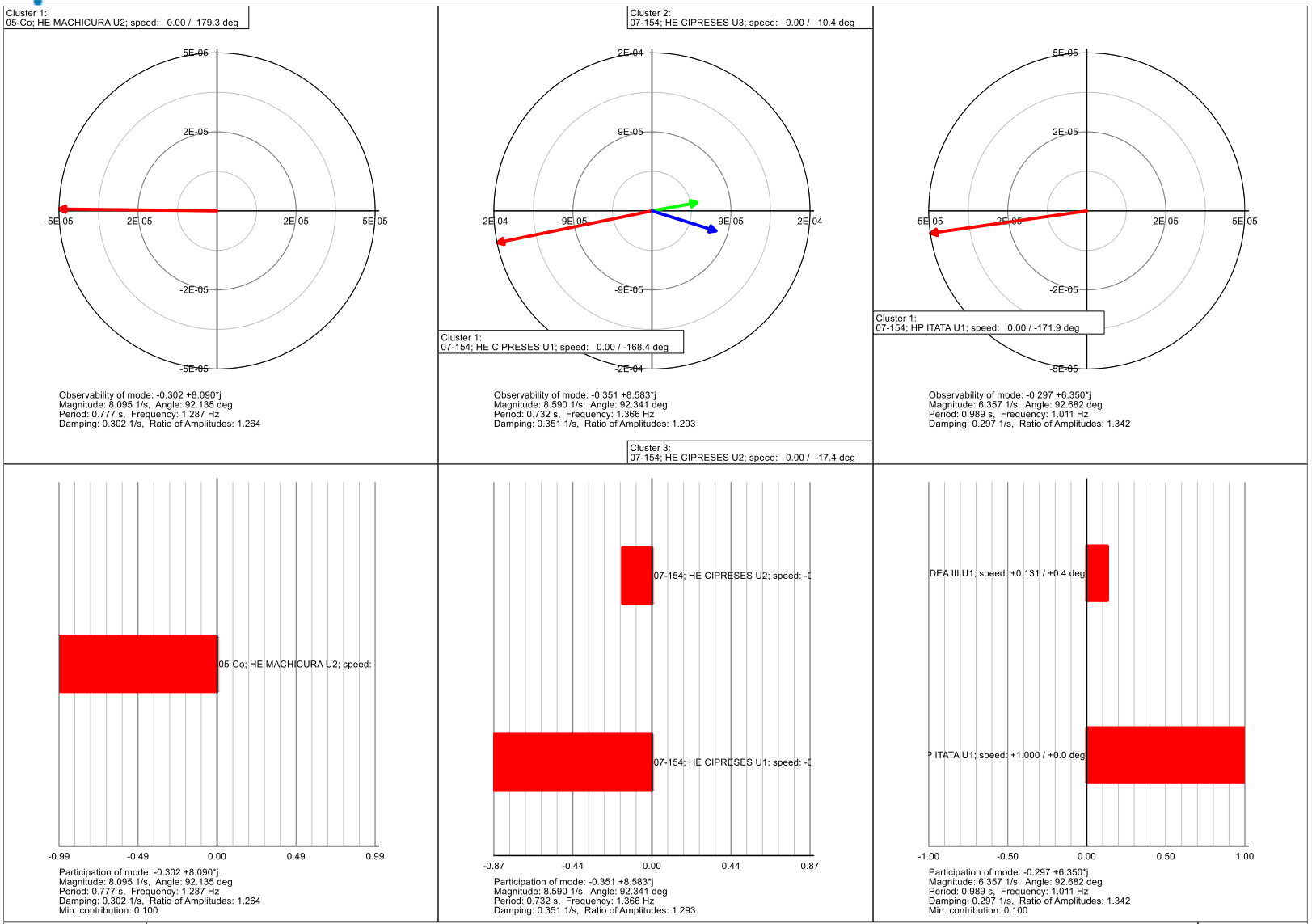


Participation of mode: -0.331 +9.753*j
Magnitude: 9.759 1/s, Angle: 91.944 deg
Period: 0.644 s, Frequency: 1.552 Hz
Damping: 0.331 1/s, Ratio of Amplitudes: 1.238
Min. contribution: 0.100

14.4.4 Red N-1 Caso 3.- Entre Ríos - Ancoa 500 kV





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21.-RedN-103ChaAnc Modos A 442-489-438

Date: 10/01/2022

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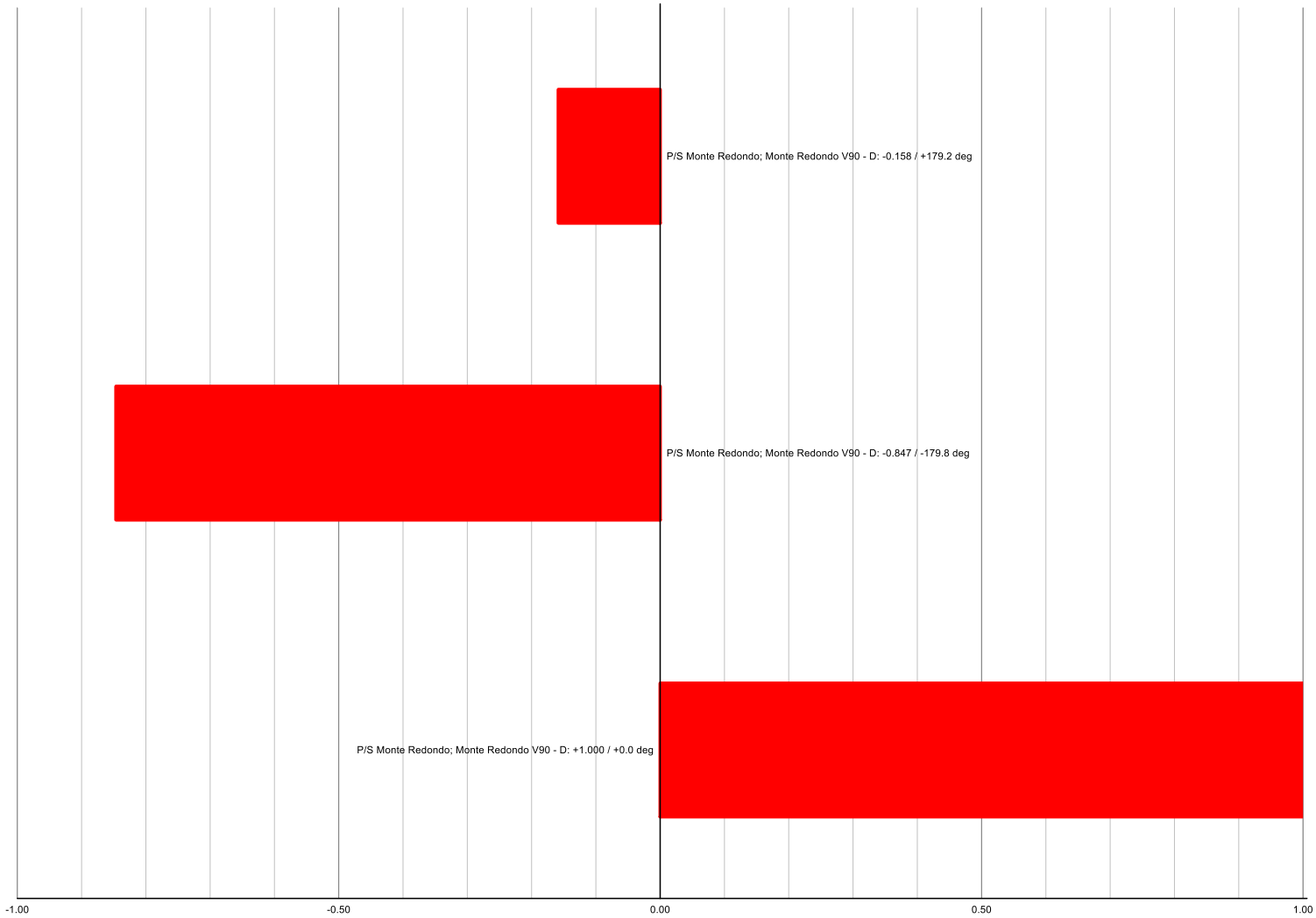
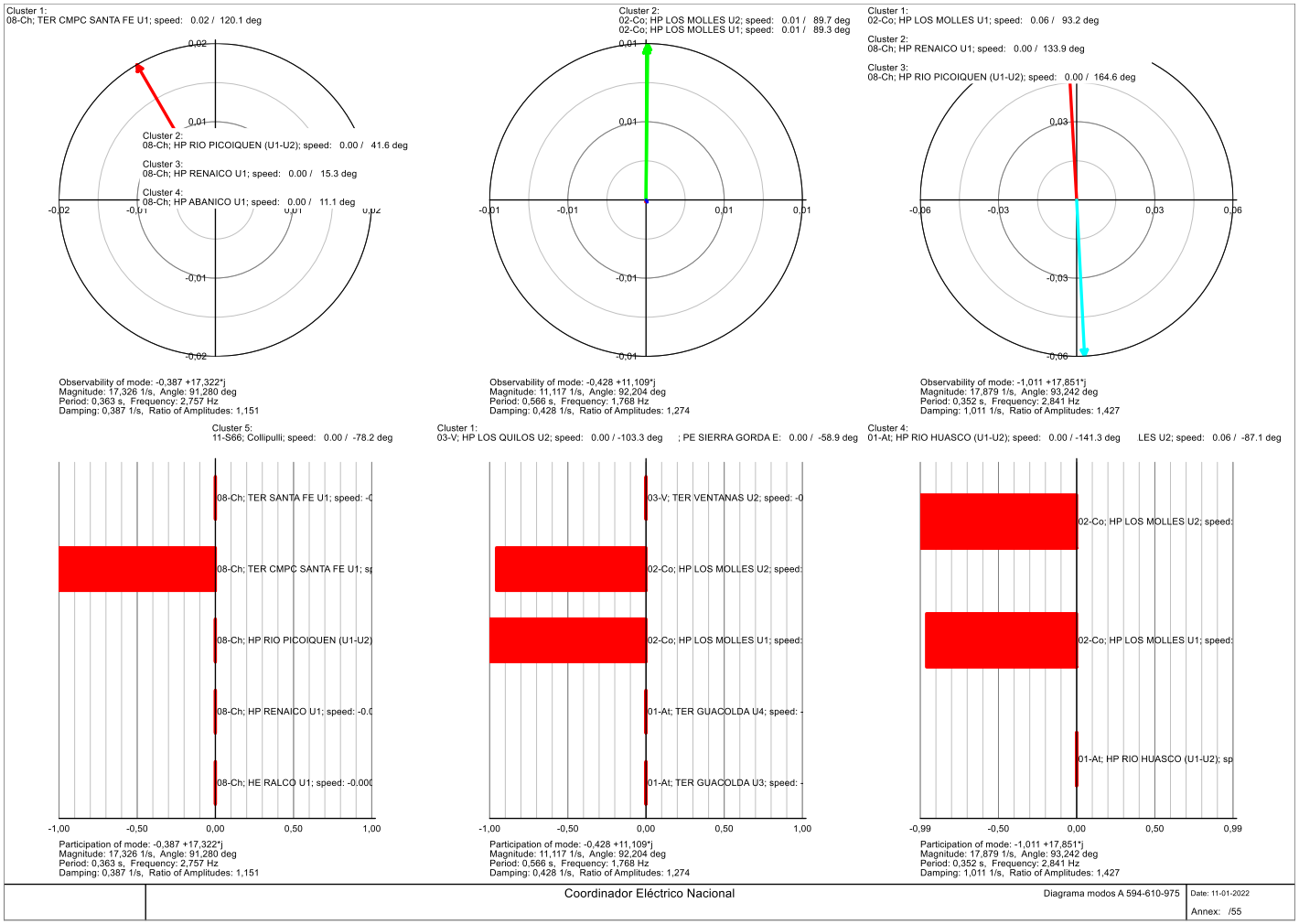
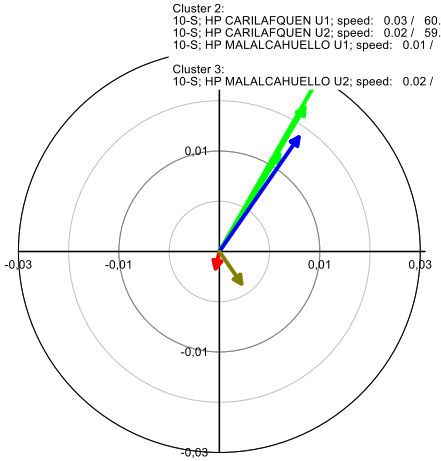


Participation of mode: -0.331 +9.753*j
Magnitude: 9.759 1/s, Angle: 91.944 deg
Period: 0.644 s, Frequency: 1.552 Hz
Damping: 0.331 1/s, Ratio of Amplitudes: 1.238
Min. contribution: 0.100

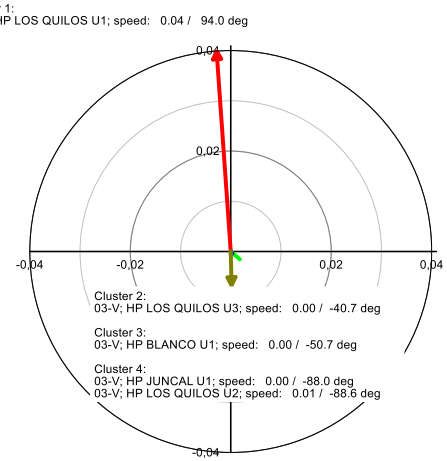
14.5 Escenario E5 DB día Ene2022

14.5.1 Red N

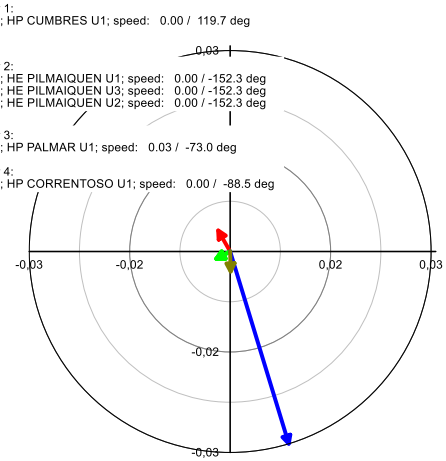




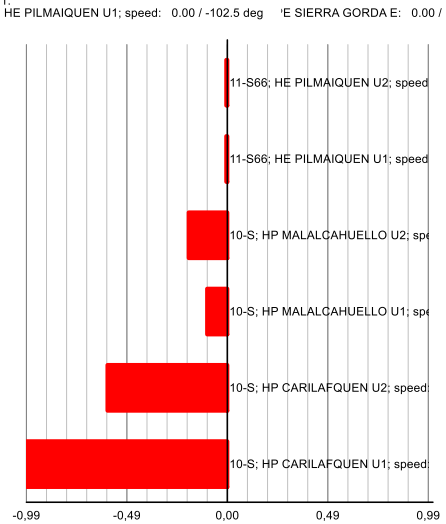
Observability of mode: -0,663 +9,876*j
Magnitude: 9,898 1/s, Angle: 93,839 deg
Period: 0,636 s, Frequency: 1,572 Hz
Damping: 0,663 1/s, Ratio of Amplitudes: 1,524



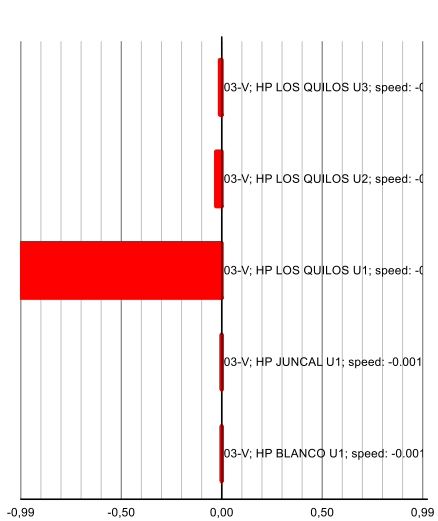
Observability of mode: -0,811 +11,548*j
Magnitude: 11,577 1/s, Angle: 94,019 deg
Period: 0,544 s, Frequency: 1,838 Hz
Damping: 0,811 1/s, Ratio of Amplitudes: 1,555



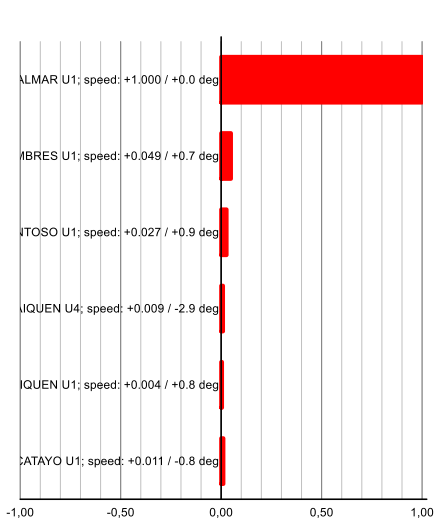
Observability of mode: -0,886 +9,517*j
Magnitude: 9,558 1/s, Angle: 95,318 deg
Period: 0,660 s, Frequency: 1,515 Hz
Damping: 0,886 1/s, Ratio of Amplitudes: 1,795



Participation of mode: -0,663 +9,876*j
Magnitude: 9,898 1/s, Angle: 93,839 deg
Period: 0,636 s, Frequency: 1,572 Hz
Damping: 0,663 1/s, Ratio of Amplitudes: 1,524



Participation of mode: -0,811 +11,548*j
Magnitude: 11,577 1/s, Angle: 94,019 deg
Period: 0,544 s, Frequency: 1,838 Hz
Damping: 0,811 1/s, Ratio of Amplitudes: 1,555



Participation of mode: -0,886 +9,517*j
Magnitude: 9,558 1/s, Angle: 95,318 deg
Period: 0,660 s, Frequency: 1,515 Hz
Damping: 0,886 1/s, Ratio of Amplitudes: 1,795

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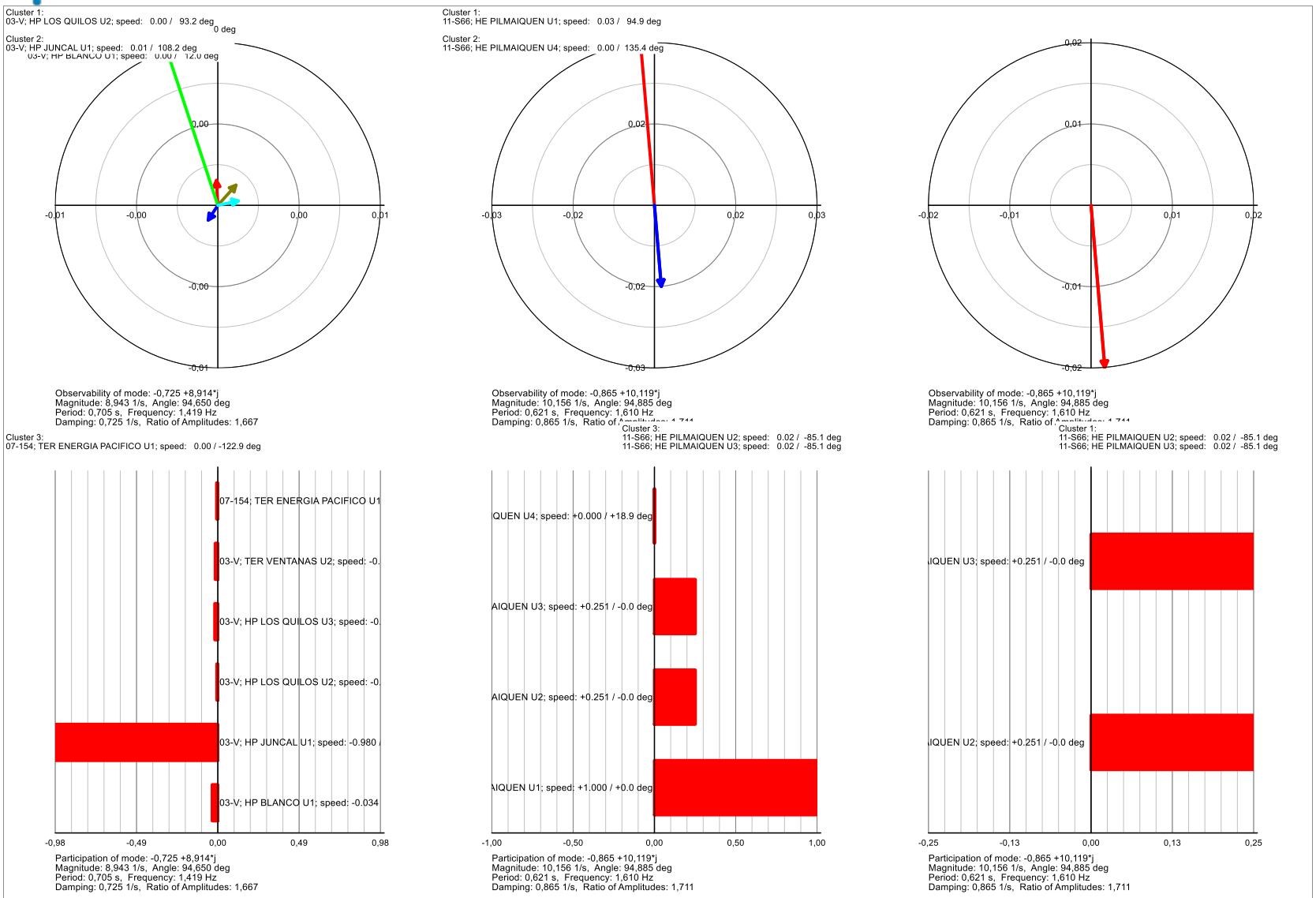

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Diagrama modos A 798-840-842

Date: 11-01-2022

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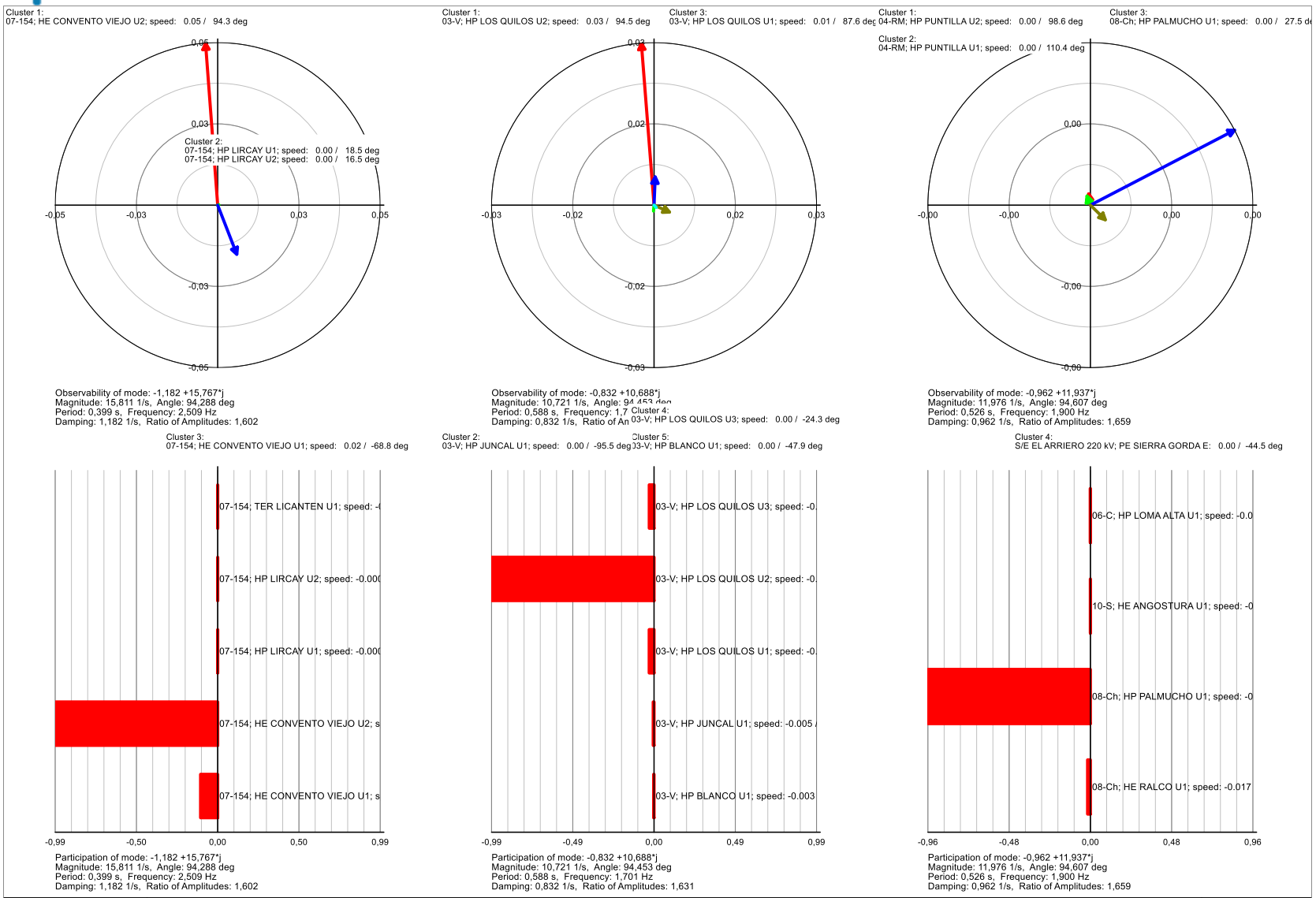

Coordinador Eléctrico Nacional

Diagrama modos A 1013-833-885

Date: 11-01-2022

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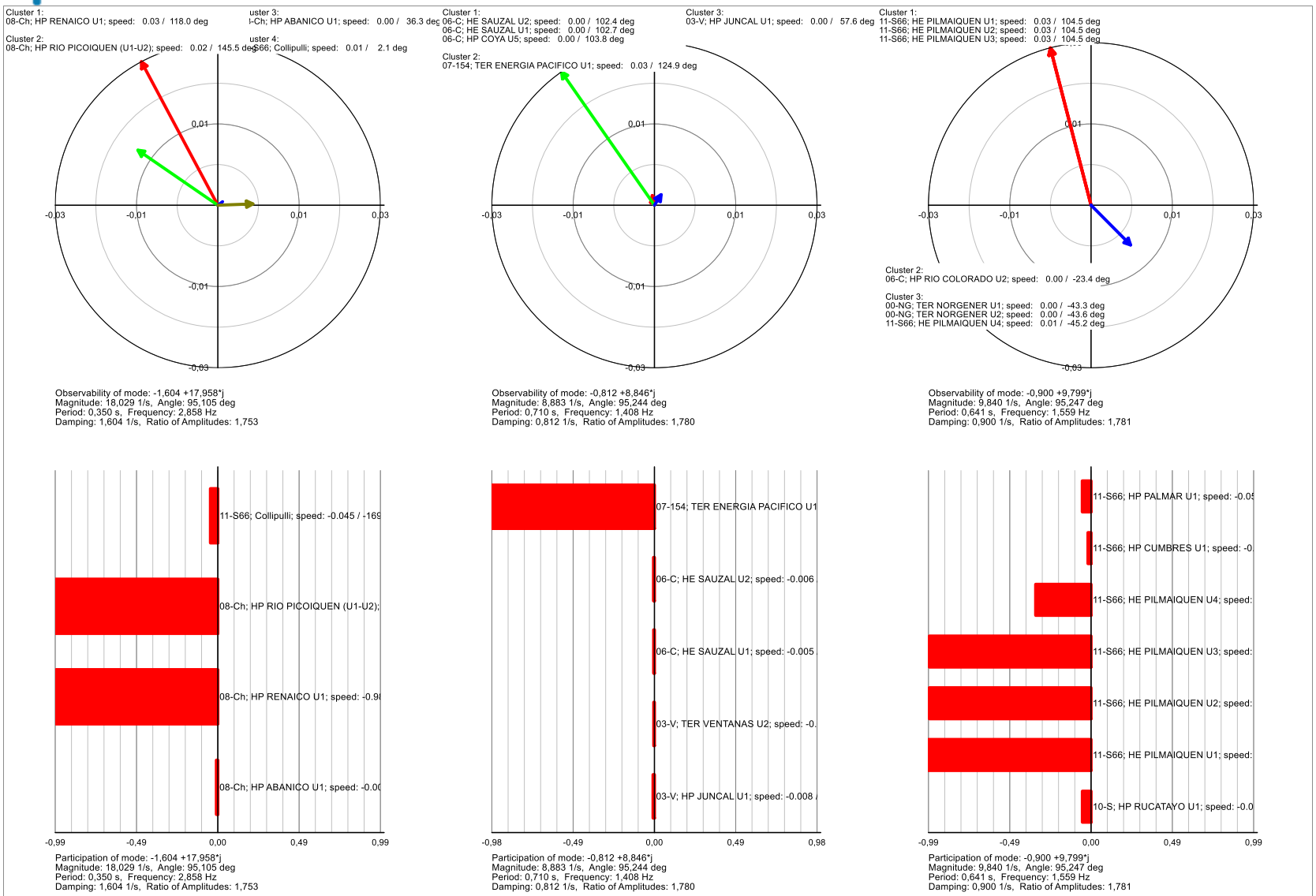

Coordinador Eléctrico Nacional

Diagrama modos A 1124-823-860

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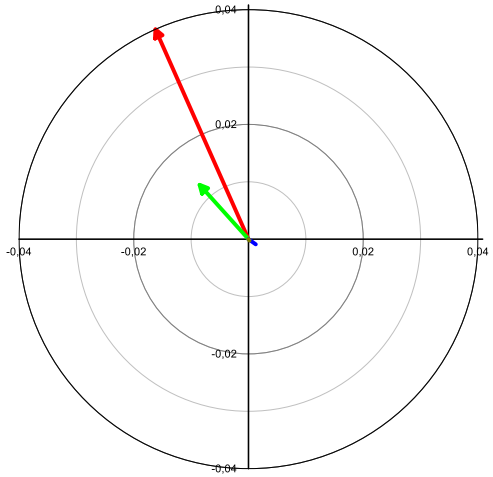
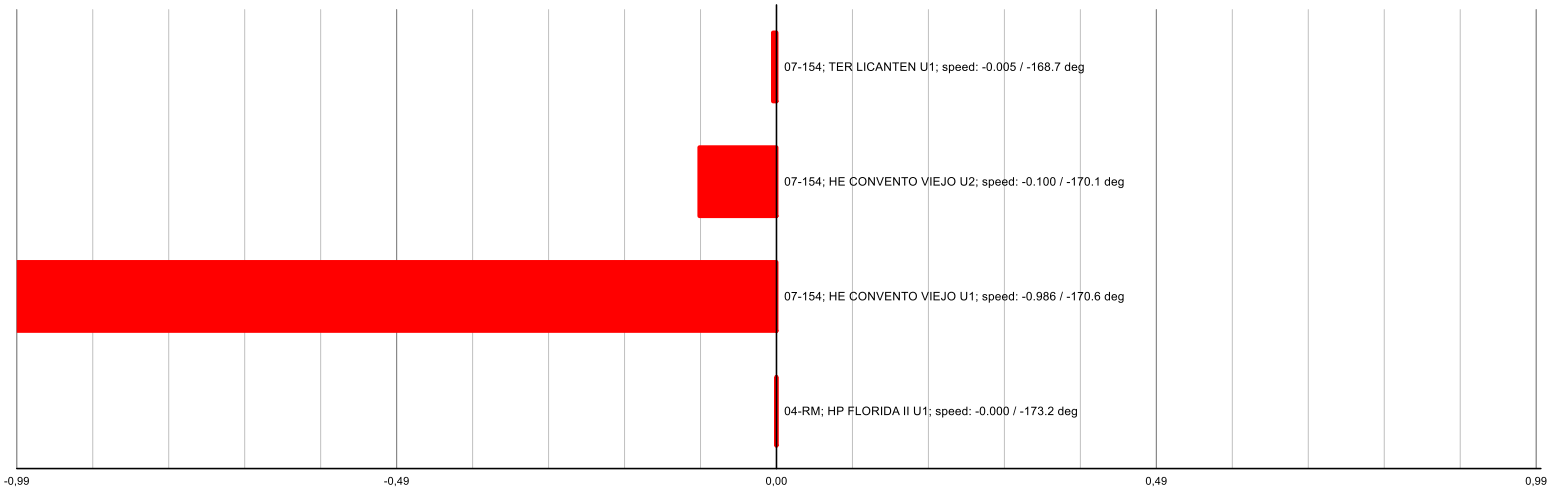
Cluster 1:
07-154; HE CONVENTO VIEJO U1; speed: 0.04 / 113.9 deg

Cluster 2:
07-154; HE CONVENTO VIEJO U2; speed: 0.01 / 132.0 deg

Cluster 3:
04-RM; HP FLORIDA U3; speed: 0.00 / -56.5 deg



Observability of mode: -1,335 +13,834*j
Magnitude: 13,898 1/s, Angle: 95,513 deg
Period: 0,454 s, Frequency: 2,202 Hz
Damping: 1,335 1/s, Ratio of Amplitudes: 1,834



Participation of mode: -1,335 +13,834*j
Magnitude: 13,898 1/s, Angle: 95,513 deg
Period: 0,454 s, Frequency: 2,202 Hz
Damping: 1,335 1/s, Ratio of Amplitudes: 1,834

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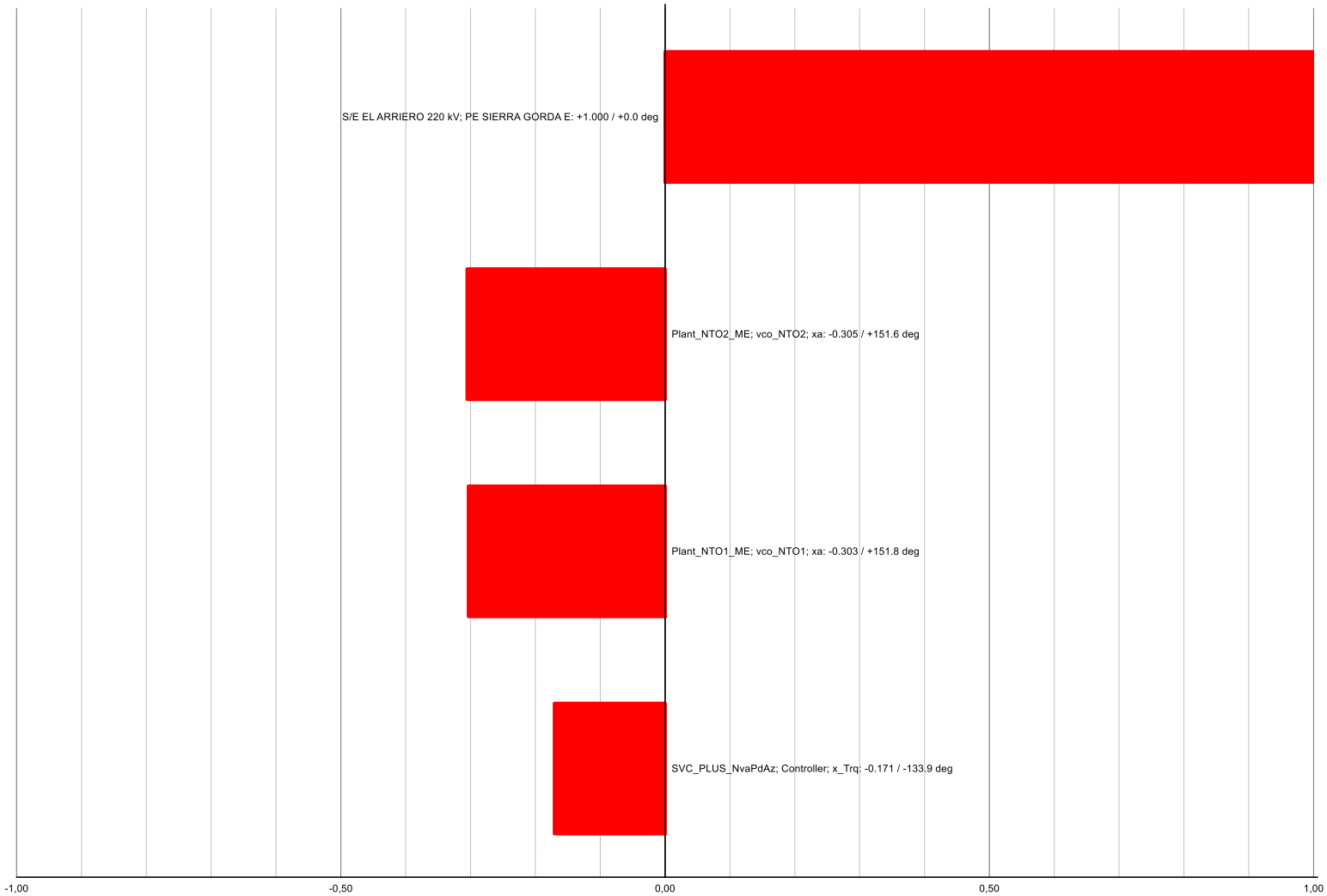

Observability of mode: -0,604 +9,777*j
Magnitude: 9,796 1/s, Angle: 93,536 deg
Period: 0,643 s, Frequency: 1,556 Hz
Damping: 0,604 1/s, Ratio of Amplitudes: 1,474
Min. contribution: 0,100

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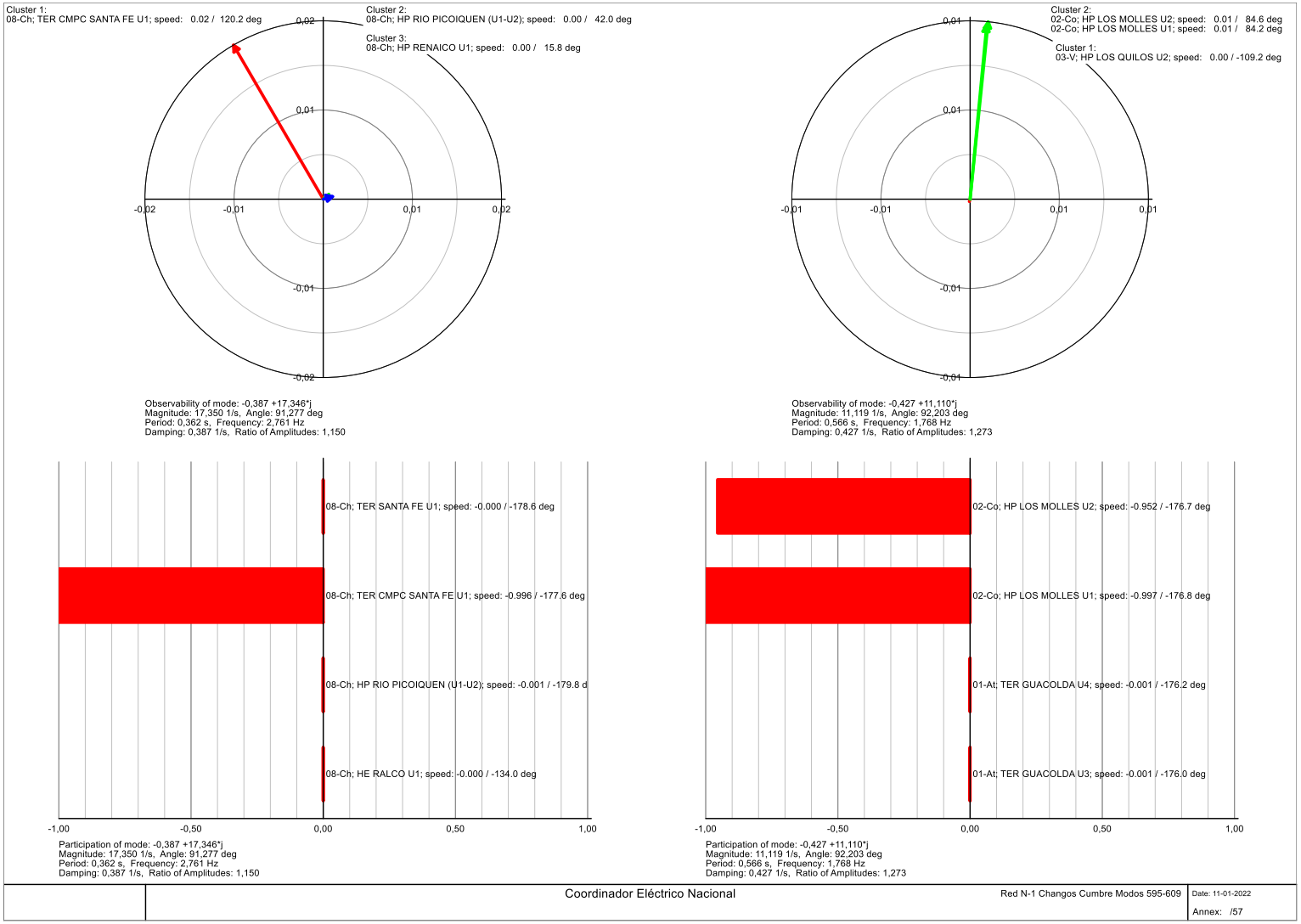
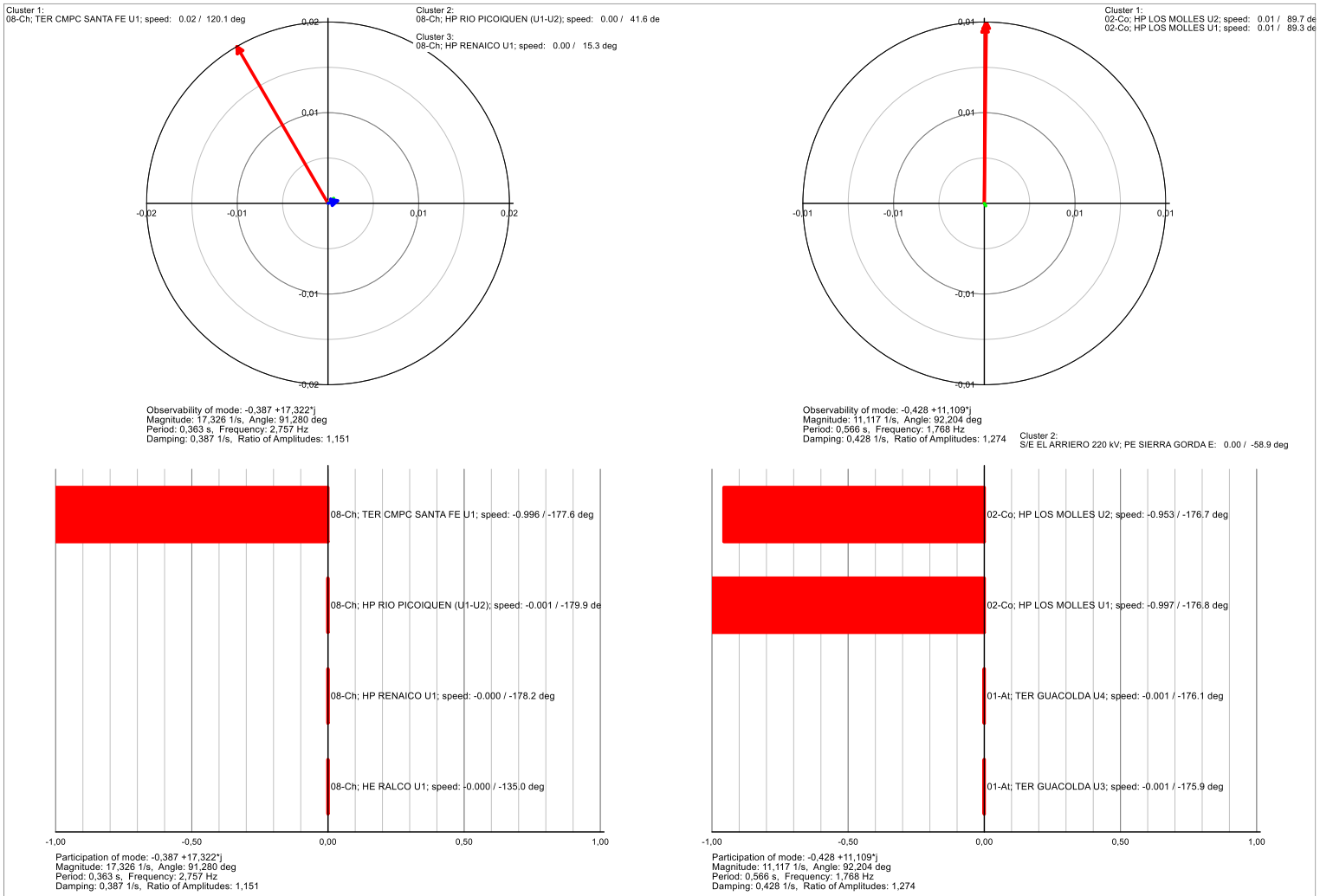
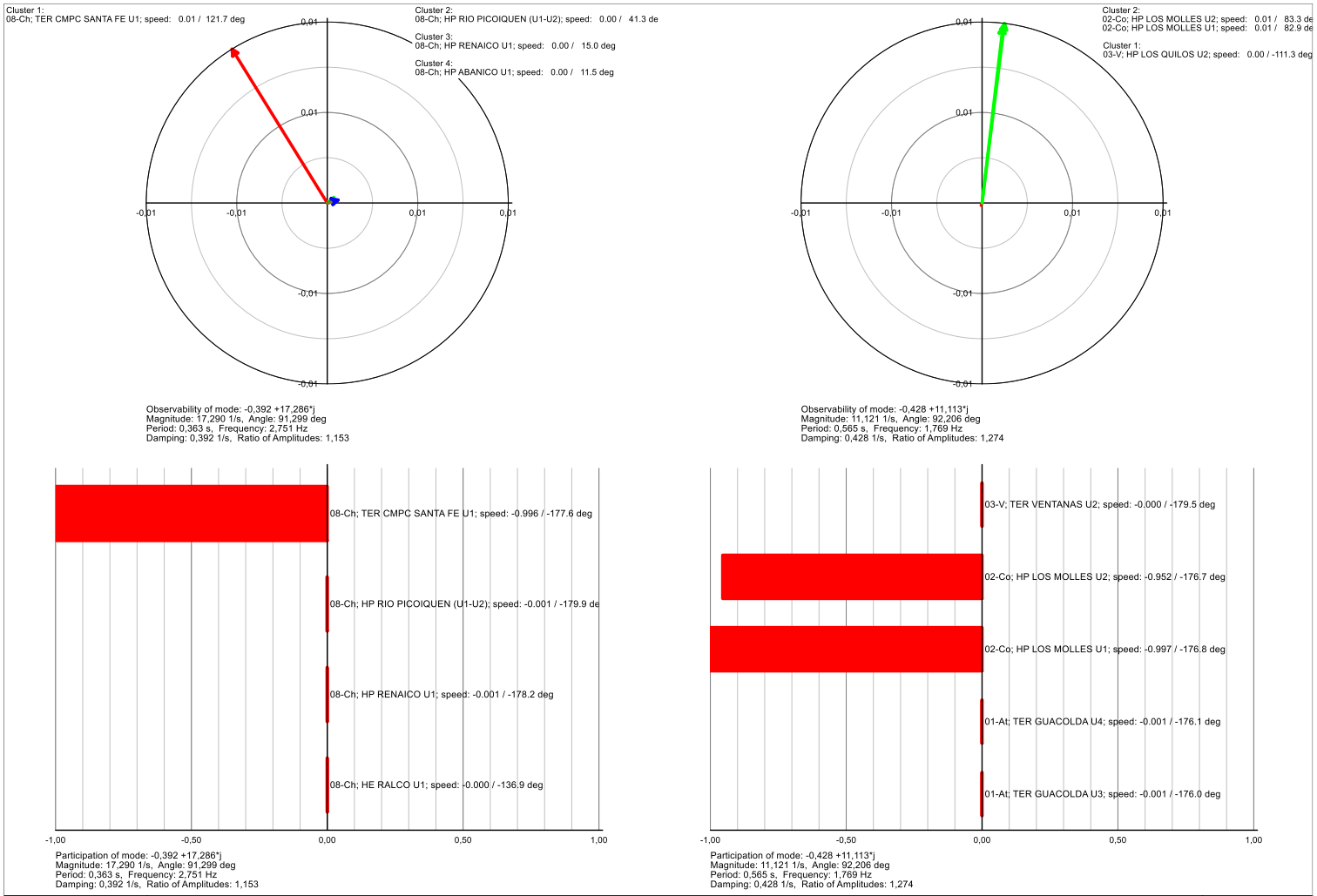
14.5.2 Red N-1 Caso 1.- Changos Cumbres 500 kV



14.5.3 Red N-1 Caso 2.- Nueva Pan de Azúcar - Polpaico 500 kV

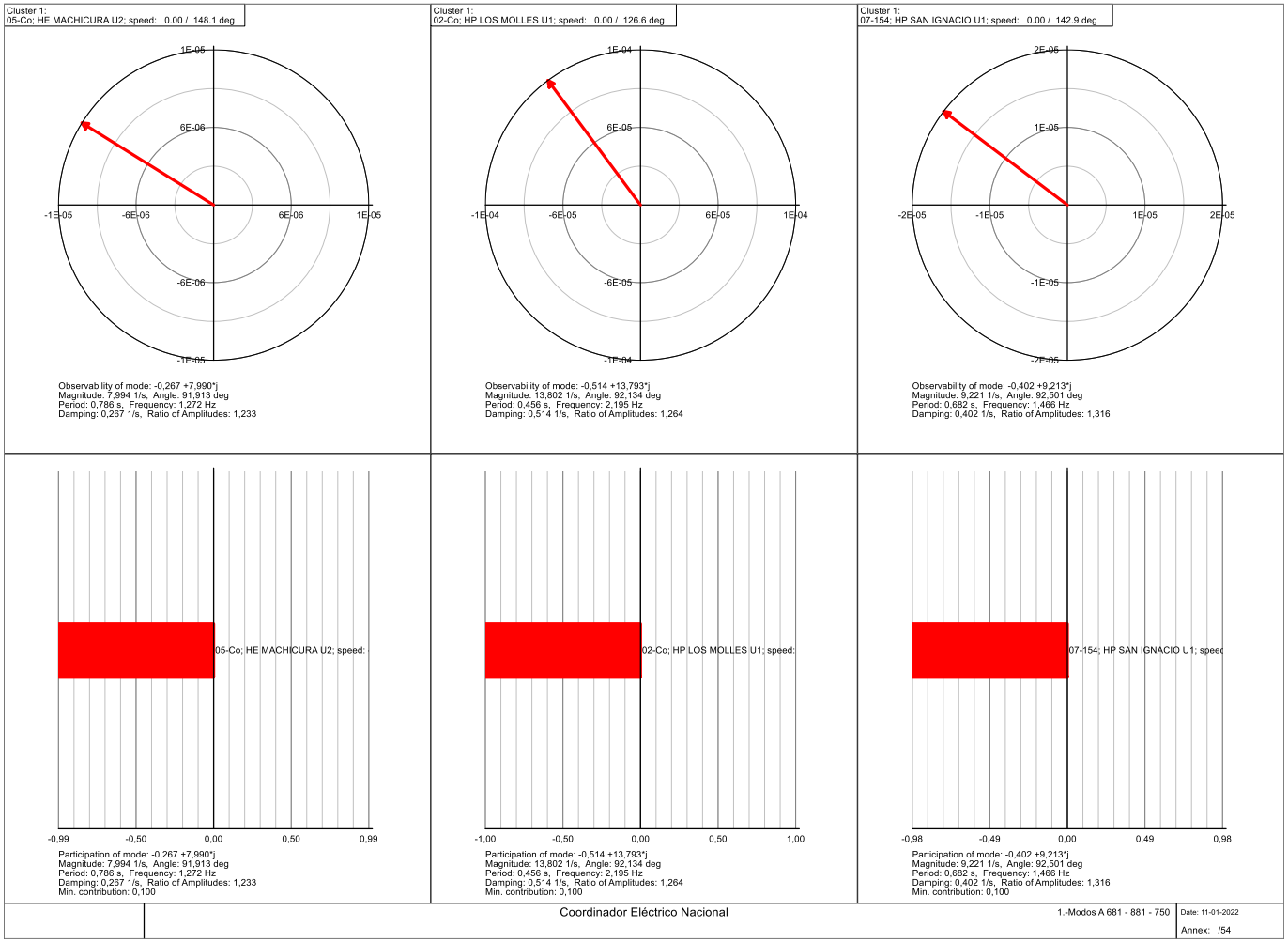


14.5.4 Red N-1 Caso 3.- Charrúa - Ancoa 500 kV

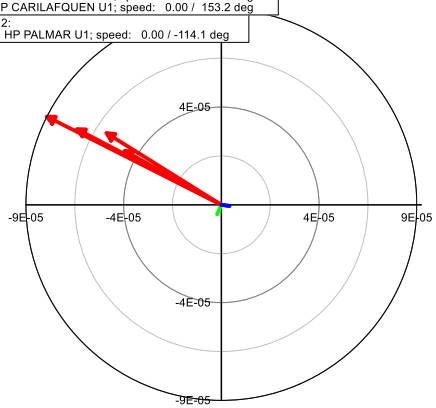


14.6 Escenario E6 DB noche Sep2022

14.6.1 Red N

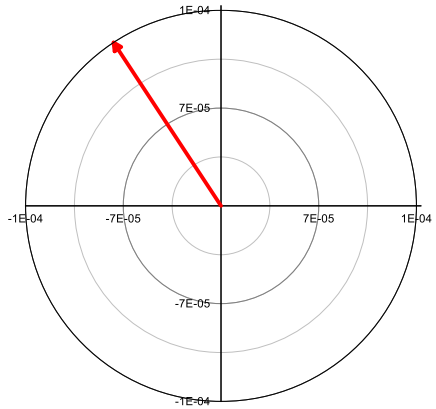


Cluster 1:
10-S; HP MALALCAHUELLO U2; speed: 0.00 / 148.0 deg
10-S; HP MALALCAHUELLO U1; speed: 0.00 / 150.8 deg
10-S; HP CARILAFQUEN U2; speed: 0.00 / 152.3 deg
10-S; HP CARILAFQUEN U1; speed: 0.00 / 153.2 deg
Cluster 2:
11-S66; HP PALMAR U1; speed: 0.00 / -114.1 deg



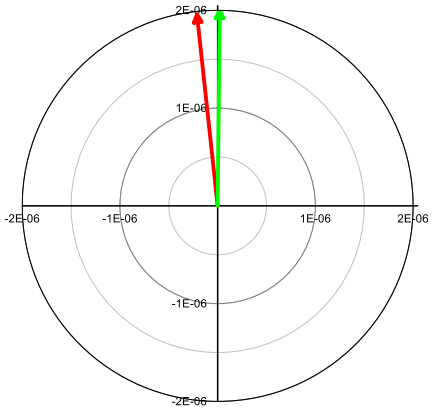
Observability of mode: -0,665 +9,932*j
Magnitude: 9,954 1/s, Angle: 93,831 deg
Period: 0,633 s, Frequency: 1,581 Hz
Damping: 0,665 1/s, Ratio of Amplitudes: 1,523

Cluster 1:
07-154; HE CONVENTO VIEJO U1; speed: 0.00 / 123.4 deg



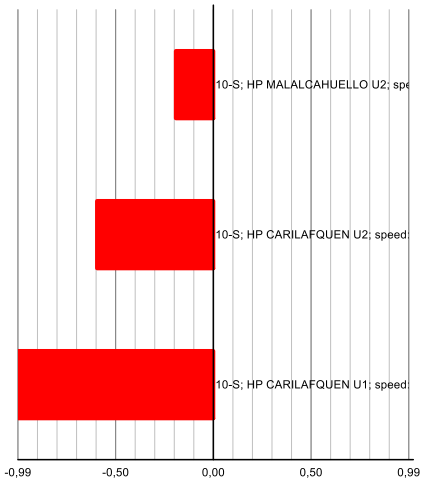
Observability of mode: -1,073 +15,929*j
Magnitude: 15,965 1/s, Angle: 93,853 deg
Period: 0,394 s, Frequency: 2,535 Hz
Damping: 1,073 1/s, Ratio of Amplitudes: 1,527

Cluster 1:
07-154; TER NUEVA ALDEA III U1; speed: 0.00 / 96.2 deg

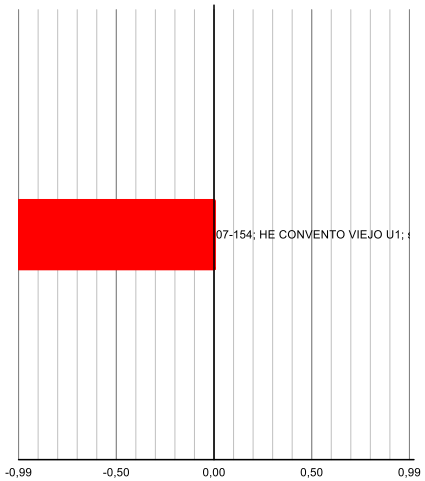


Observability of mode: -0,429 +5,965*j
Magnitude: 5,981 1/s, Angle: 94,111 deg
Period: 1,053 s, Frequency: 0,949 Hz
Damping: 0,429 1/s, Ratio of Amplitudes: 1,571

Cluster 3:
10-S; HE CANUTILLAR U2; speed: 0.00 / -7.6 deg
10-S; HE CANUTILLAR U1; speed: 0.00 / -7.6 deg

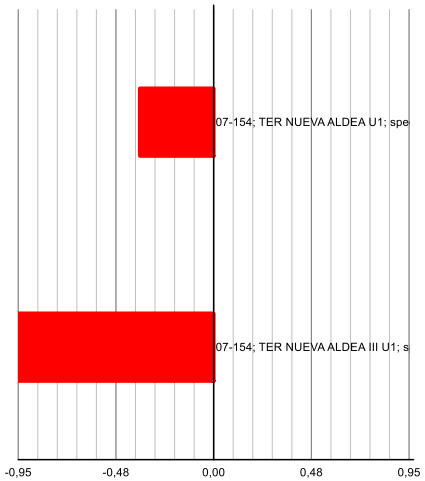


Participation of mode: -0,665 +9,932*j
Magnitude: 9,954 1/s, Angle: 93,831 deg
Period: 0,633 s, Frequency: 1,581 Hz
Damping: 0,665 1/s, Ratio of Amplitudes: 1,523
Min. contribution: 0,100

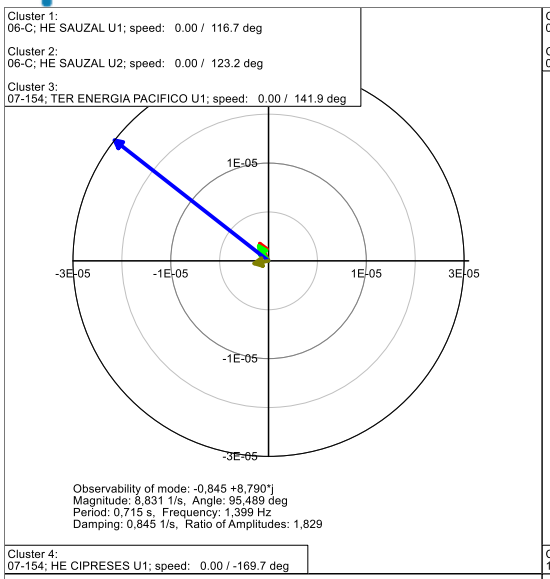


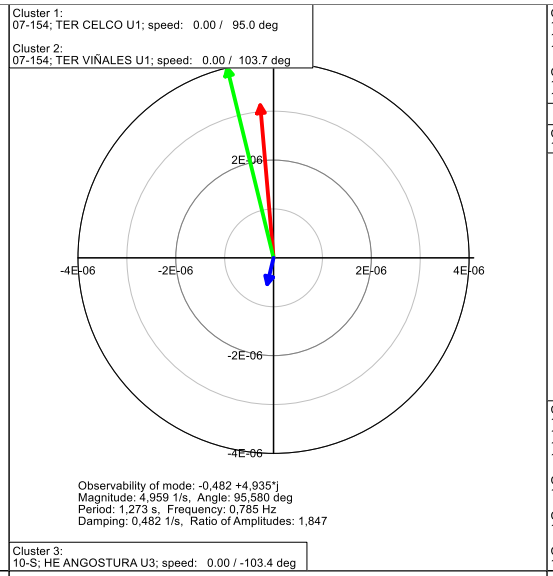
Participation of mode: -1,073 +15,929*j
Magnitude: 15,965 1/s, Angle: 93,853 deg
Period: 0,394 s, Frequency: 2,535 Hz
Damping: 1,073 1/s, Ratio of Amplitudes: 1,527
Min. contribution: 0,100

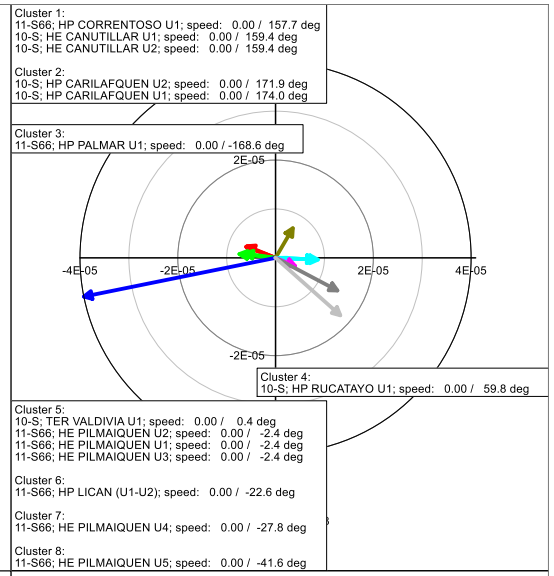
Cluster 2:
07-154; TER NUEVA ALDEA U1; speed: 0.00 / 89.4 deg

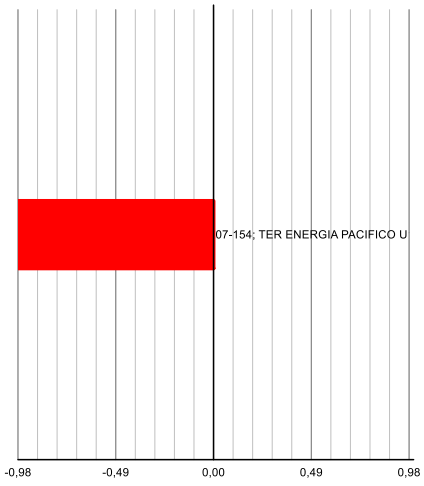


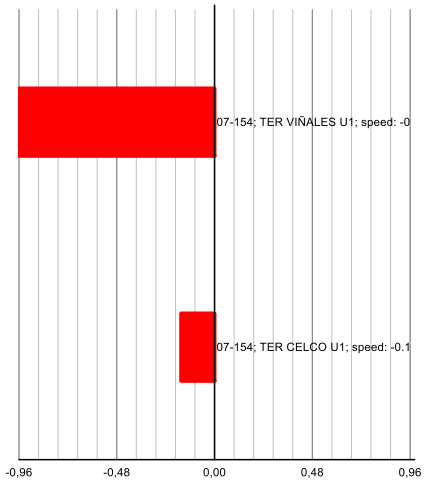
Participation of mode: -0,429 +5,965*j
Magnitude: 5,981 1/s, Angle: 94,111 deg
Period: 1,053 s, Frequency: 0,949 Hz
Damping: 0,429 1/s, Ratio of Amplitudes: 1,571
Min. contribution: 0,100

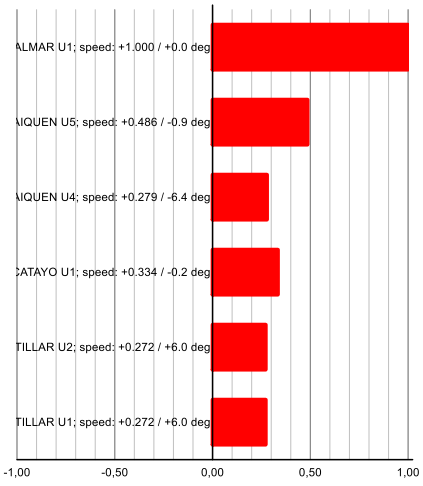

Cluster 1:
06-C; HE SAUZAL U1; speed: 0.00 / 116.7 deg
Cluster 2:
06-C; HE SAUZAL U2; speed: 0.00 / 123.2 deg
Cluster 3:
07-154; TER ENERGIA PACIFICO U1; speed: 0.00 / 141.9 deg
1E-05
-3E-05
-1E-05
1E-05
3E-05
-1E-05
-3E-05
Observability of mode: -0,845 +8,790*j
Magnitude: 8,831 1/s, Angle: 95,489 deg
Period: 0,715 s, Frequency: 1,399 Hz
Damping: 0,845 1/s, Ratio of Amplitudes: 1,829
Cluster 4:
07-154; HE CIPRESES U1; speed: 0.00 / -169.7 deg

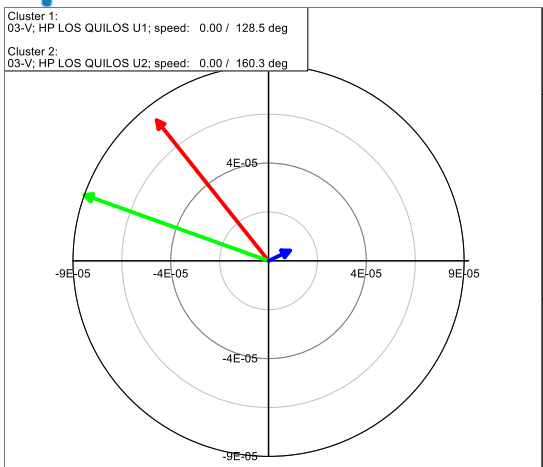

Cluster 1:
07-154; TER CELCO U1; speed: 0.00 / 95.0 deg
Cluster 2:
07-154; TER VIÑALES U1; speed: 0.00 / 103.7 deg
2E-06
-4E-06
-2E-06
2E-06
4E-06
-2E-06
-4E-06
Observability of mode: -0,482 +4,935*j
Magnitude: 4,959 1/s, Angle: 95,580 deg
Period: 1,273 s, Frequency: 0,785 Hz
Damping: 0,482 1/s, Ratio of Amplitudes: 1,847
Cluster 3:
10-S; HE ANGOSTURA U3; speed: 0.00 / -103.4 deg


Cluster 1:
11-S66; HP CORRENTOSO U1; speed: 0.00 / 157.7 deg
10-S; HE CANUTILLAR U1; speed: 0.00 / 159.4 deg
10-S; HE CANUTILLAR U2; speed: 0.00 / 159.4 deg
Cluster 2:
10-S; HP CARILAFQUEN U2; speed: 0.00 / 171.9 deg
10-S; HP CARILAFQUEN U1; speed: 0.00 / 174.0 deg
Cluster 3:
11-S66; HP PALMAR U1; speed: 0.00 / -168.6 deg
2E-05
-4E-05
-2E-05
2E-05
4E-05
-2E-05
Cluster 4:
10-S; HP RUCATAYO U1; speed: 0.00 / 59.8 deg
Cluster 5:
10-S; TER VALDIVIA U1; speed: 0.00 / 0.4 deg
11-S66; HE PILMAIQUEN U2; speed: 0.00 / -2.4 deg
11-S66; HE PILMAIQUEN U1; speed: 0.00 / -2.4 deg
11-S66; HE PILMAIQUEN U3; speed: 0.00 / -2.4 deg
Cluster 6:
11-S66; HP LICAN (U1-U2); speed: 0.00 / -22.6 deg
Cluster 7:
11-S66; HE PILMAIQUEN U4; speed: 0.00 / -27.8 deg
Cluster 8:
11-S66; HE PILMAIQUEN U5; speed: 0.00 / -41.6 deg

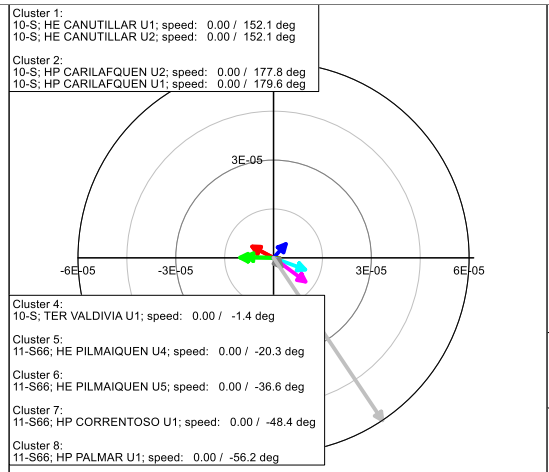

07-154; TER ENERGIA PACIFICO U
-0,98
-0,49
0,00
0,49
0,98
Participation of mode: -0,845 +8,790*j
Magnitude: 8,831 1/s, Angle: 95,489 deg
Period: 0,715 s, Frequency: 1,399 Hz
Damping: 0,845 1/s, Ratio of Amplitudes: 1,829
Min. contribution: 0,100


07-154; TER VIÑALES U1; speed: -0
07-154; TER CELCO U1; speed: -0.1
-0,96
-0,48
0,00
0,48
0,96
Participation of mode: -0,482 +4,935*j
Magnitude: 4,959 1/s, Angle: 95,580 deg
Period: 1,273 s, Frequency: 0,785 Hz
Damping: 0,482 1/s, Ratio of Amplitudes: 1,847
Min. contribution: 0,100

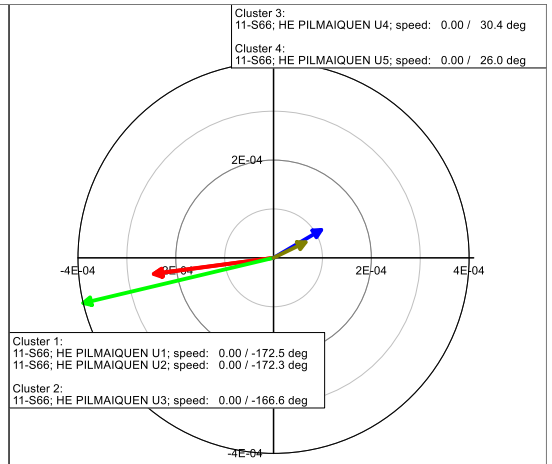

ALMAR U1; speed: +1.000 / +0.0 deg
AIQUEN U5; speed: +0.486 / -0.9 deg
AIQUEN U4; speed: +0.279 / -6.4 deg
CATAYO U1; speed: +0.334 / -0.2 deg
TILLAR U2; speed: +0.272 / +6.0 deg
TILLAR U1; speed: +0.272 / +6.0 deg
-1,00
-0,50
0,00
0,50
1,00
Participation of mode: -0,951 +9,727*j
Magnitude: 9,773 1/s, Angle: 95,584 deg
Period: 0,646 s, Frequency: 1,548 Hz
Damping: 0,951 1/s, Ratio of Amplitudes: 1,848
Min. contribution: 0,100



Observability of mode: -0,895 +10,399*j
Magnitude: 10,438 1/s, Angle: 94,917 deg
Period: 0,604 s, Frequency: 1,655 Hz
Damping: 0,895 1/s, Ratio of Amplitudes: 1,717

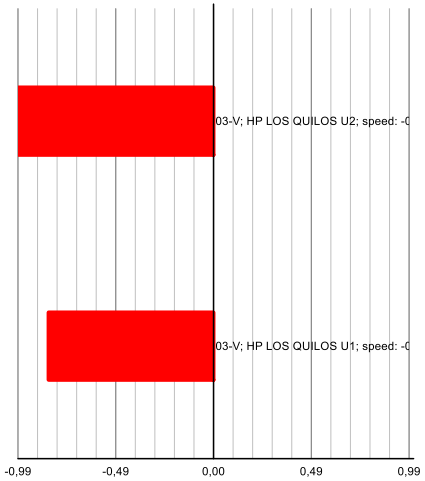


Observability of mode: -0,866 +9,824*j
Magnitude: 9,862 1/s, Angle: 95,037 deg
Period: 0,640 s, Frequency: 1,563 Hz
Damping: 0,866 1/s, Ratio of Amplitudes: 1,740



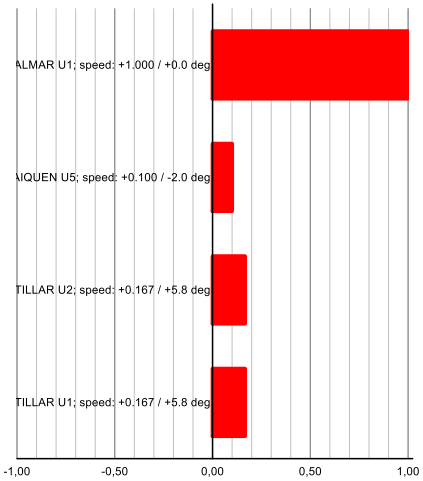
Observability of mode: -1,019 +10,975*j
Magnitude: 11,022 1/s, Angle: 95,307 deg
Period: 0,573 s, Frequency: 1,747 Hz
Damping: 1,019 1/s, Ratio of Amplitudes: 1,793

Cluster 3:
03-V; HP LOS QUILOS U3; speed: 0.00 / 25.6 deg

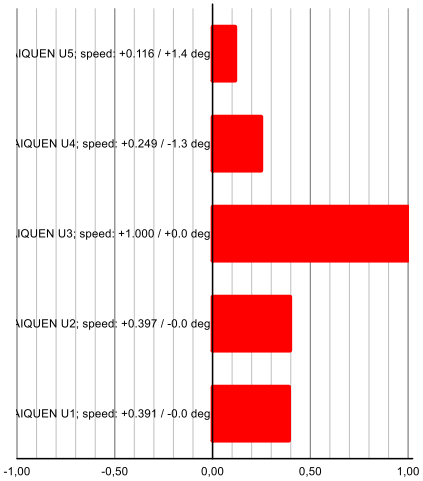


Participation of mode: -0,895 +10,399*j
Magnitude: 10,438 1/s, Angle: 94,917 deg
Period: 0,604 s, Frequency: 1,655 Hz
Damping: 0,895 1/s, Ratio of Amplitudes: 1,717
Min. contribution: 0,100

Cluster 3:
10-S; HP RUCATAYO U1; speed: 0.00 / 48.3 deg

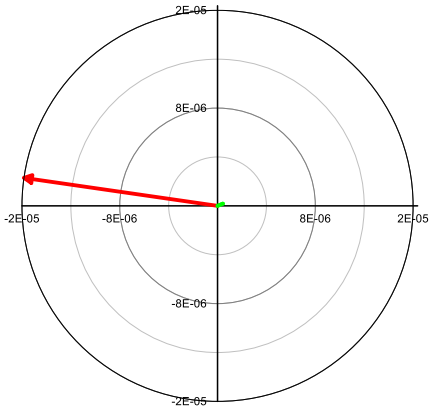


Participation of mode: -0,866 +9,824*j
Magnitude: 9,862 1/s, Angle: 95,037 deg
Period: 0,640 s, Frequency: 1,563 Hz
Damping: 0,866 1/s, Ratio of Amplitudes: 1,740
Min. contribution: 0,100



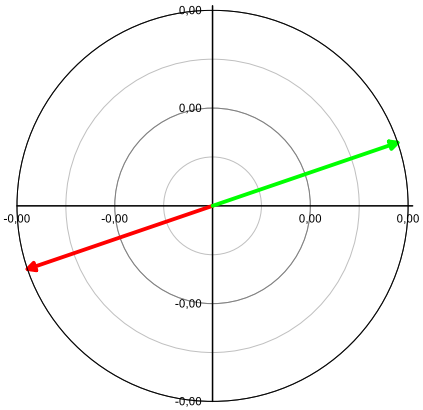
Participation of mode: -1,019 +10,975*j
Magnitude: 11,022 1/s, Angle: 95,307 deg
Period: 0,573 s, Frequency: 1,747 Hz
Damping: 1,019 1/s, Ratio of Amplitudes: 1,793
Min. contribution: 0,100

Cluster 1:
08-Ch; HP PALMUCHO U1; speed: 0.00 / 171.8 deg



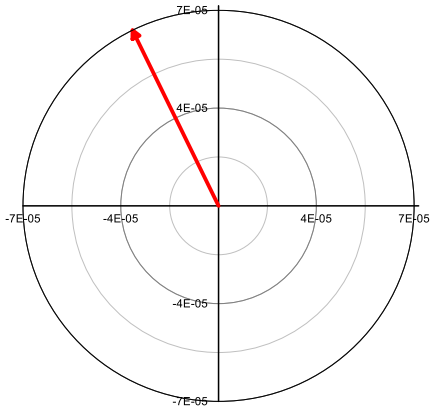
Observability of mode: -0,922 +11,612*j
Magnitude: 11,649 1/s, Angle: 94,538 deg
Period: 0,541 s, Frequency: 1,848 Hz
Damping: 0,922 1/s, Ratio of Amplitudes: 1,647

Cluster 2:
10-S; HE CANUTILLAR U1; speed: 0.00 / 18.9 deg



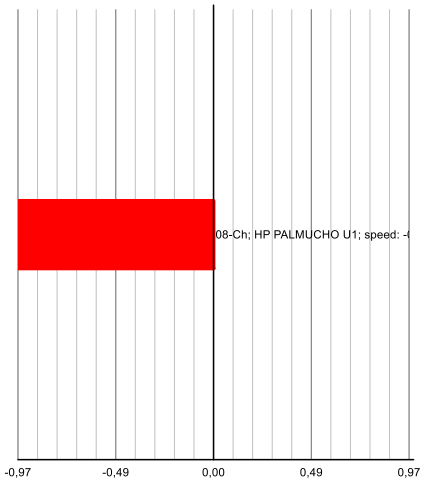
Observability of mode: -0,893 +11,037*j
Magnitude: 11,073 1/s, Angle: 94,626 deg
Period: 0,569 s, Frequency: 1,757 Hz
Damping: 0,893 1/s, Ratio of Amplitudes: 1,663

Cluster 1:
06-C; TER SANTA MARTA (U1-U10); speed: 0.00 / 116.1 deg



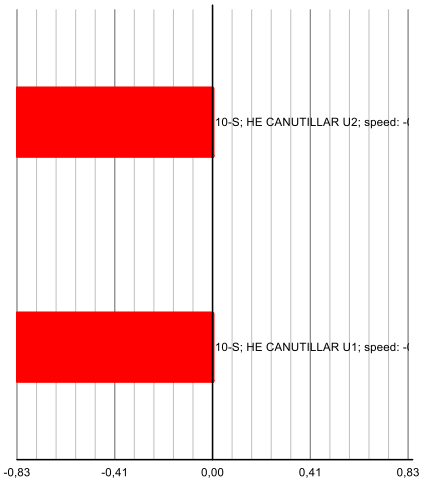
Observability of mode: -0,926 +11,258*j
Magnitude: 11,296 1/s, Angle: 94,702 deg
Period: 0,558 s, Frequency: 1,792 Hz
Damping: 0,926 1/s, Ratio of Amplitudes: 1,677

Cluster 2:
08-Ch; HE RALCO U1; speed: 0.00 / 22.6 deg
08-Ch; HE RALCO U2; speed: 0.00 / 21.8 deg

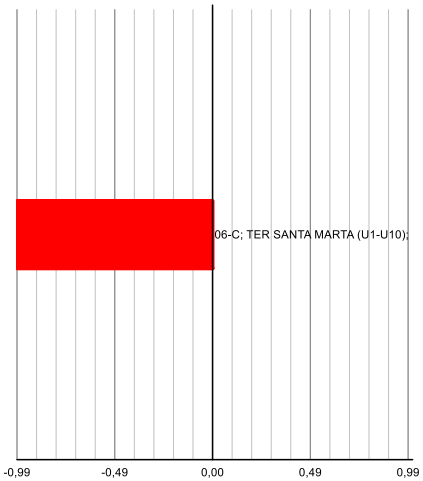


Participation of mode: -0,922 +11,612*j
Magnitude: 11,649 1/s, Angle: 94,538 deg
Period: 0,541 s, Frequency: 1,848 Hz
Damping: 0,922 1/s, Ratio of Amplitudes: 1,647
Min. contribution: 0,100

Cluster 1:
10-S; HE CANUTILLAR U2; speed: 0.00 / -161.1 deg

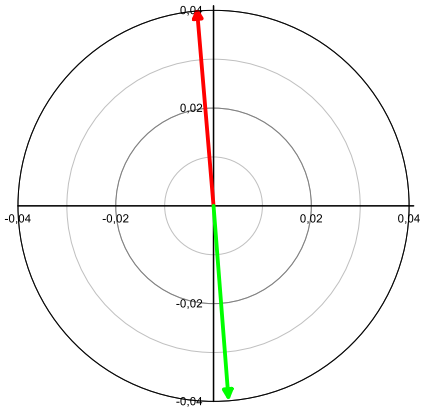


Participation of mode: -0,893 +11,037*j
Magnitude: 11,073 1/s, Angle: 94,626 deg
Period: 0,569 s, Frequency: 1,757 Hz
Damping: 0,893 1/s, Ratio of Amplitudes: 1,663
Min. contribution: 0,100



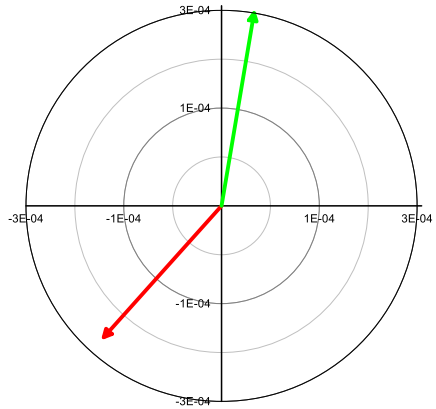
Participation of mode: -0,926 +11,258*j
Magnitude: 11,296 1/s, Angle: 94,702 deg
Period: 0,558 s, Frequency: 1,792 Hz
Damping: 0,926 1/s, Ratio of Amplitudes: 1,677
Min. contribution: 0,100

Cluster 1:
11-S66; HE PILMAIQUEN U1; speed: 0.04 / 94.8 deg



Observability of mode: -0,947 +11,243*j
Magnitude: 11,283 1/s, Angle: 94,814 deg
Period: 0,559 s, Frequency: 1,789 Hz
Damping: 0,947 1/s, Ratio of Amplitudes: 1,697

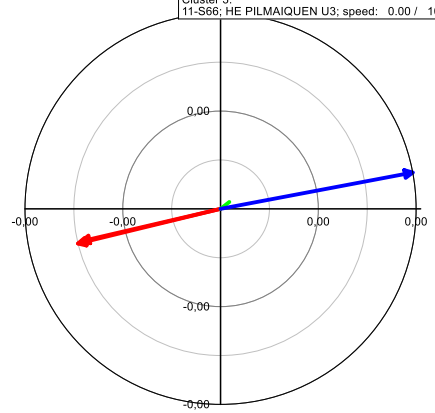
Cluster 2:
03-V; HP LOS QUILOS U1; speed: 0.00 / 80.4 deg



Observability of mode: -0,900 +10,599*j
Magnitude: 10,637 1/s, Angle: 94,852 deg
Period: 0,593 s, Frequency: 1,687 Hz
Damping: 0,900 1/s, Ratio of Amplitudes: 1,705

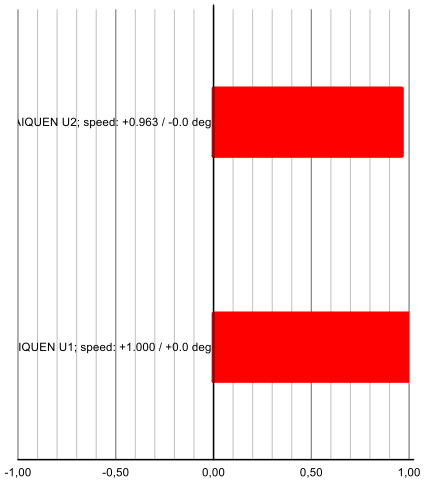
Cluster 2:
11-S66; HE PILMAIQUEN U4; speed: 0.00 / 38.1 deg

Cluster 3:
11-S66; HE PILMAIQUEN U3; speed: 0.00 / 10.7 deg



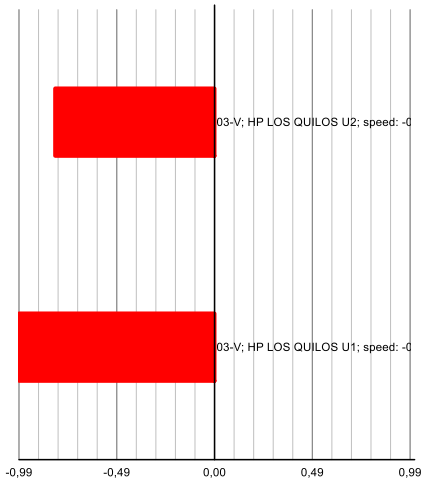
Observability of mode: -0,956 +11,180*j
Magnitude: 11,220 1/s, Angle: 94,889 deg
Period: 0,562 s, Frequency: 1,779 Hz
Damping: 0,956 1/s, Ratio of Amplitudes: 1,712

Cluster 2:
11-S66; HE PILMAIQUEN U2; speed: 0.04 / -85.6 deg



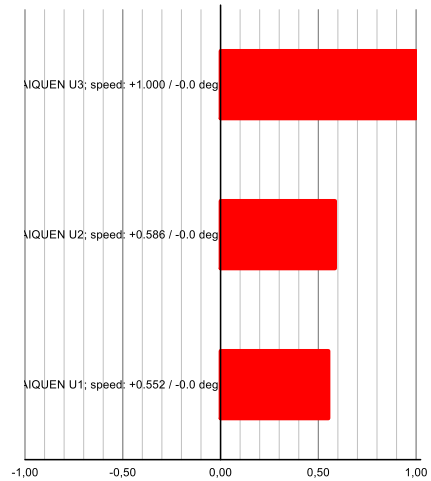
Participation of mode: -0,947 +11,243*j
Magnitude: 11,283 1/s, Angle: 94,814 deg
Period: 0,559 s, Frequency: 1,789 Hz
Damping: 0,947 1/s, Ratio of Amplitudes: 1,697
Min. contribution: 0,100

Cluster 1:
03-V; HP LOS QUILOS U2; speed: 0.00 / -131.9 deg

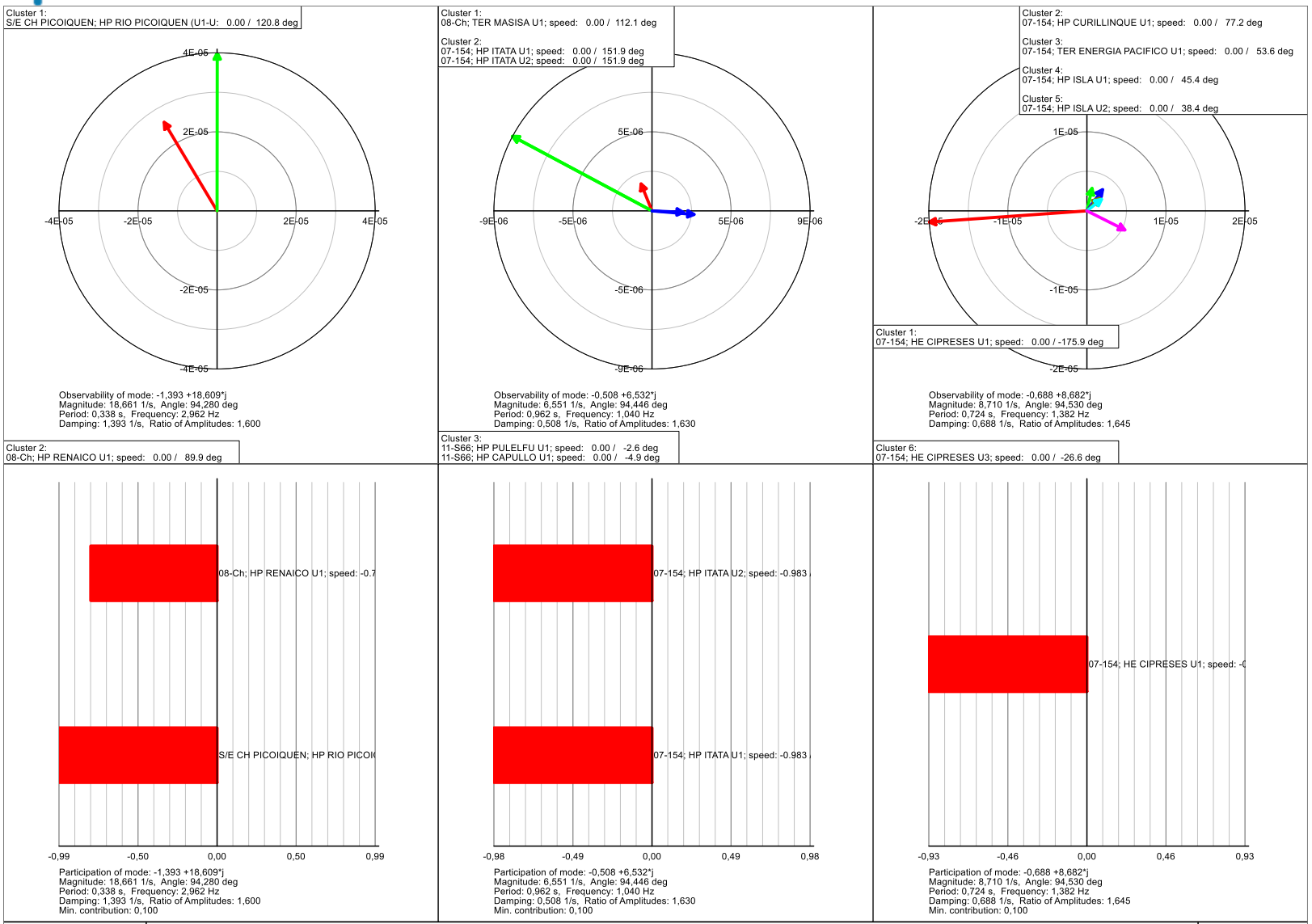


Participation of mode: -0,900 +10,599*j
Magnitude: 10,637 1/s, Angle: 94,852 deg
Period: 0,593 s, Frequency: 1,687 Hz
Damping: 0,900 1/s, Ratio of Amplitudes: 1,705
Min. contribution: 0,100

Cluster 1:
11-S66; HE PILMAIQUEN U1; speed: 0.00 / -166.9 deg
11-S66; HE PILMAIQUEN U2; speed: 0.00 / -166.3 deg



Participation of mode: -0,956 +11,180*j
Magnitude: 11,220 1/s, Angle: 94,889 deg
Period: 0,562 s, Frequency: 1,779 Hz
Damping: 0,956 1/s, Ratio of Amplitudes: 1,712
Min. contribution: 0,100



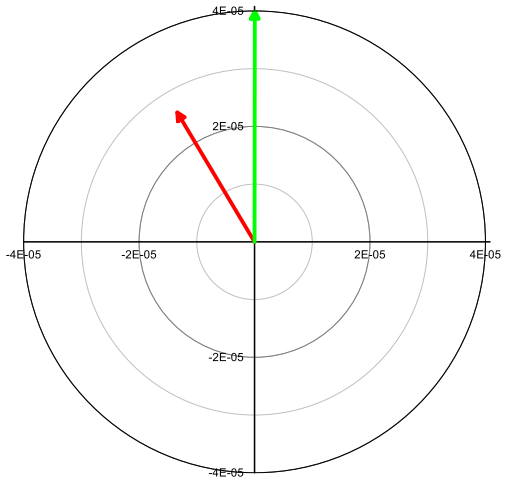
Coordinador Eléctrico Nacional

7.-Modos A 1288 - 878 - 961

Date: 11-01-2022

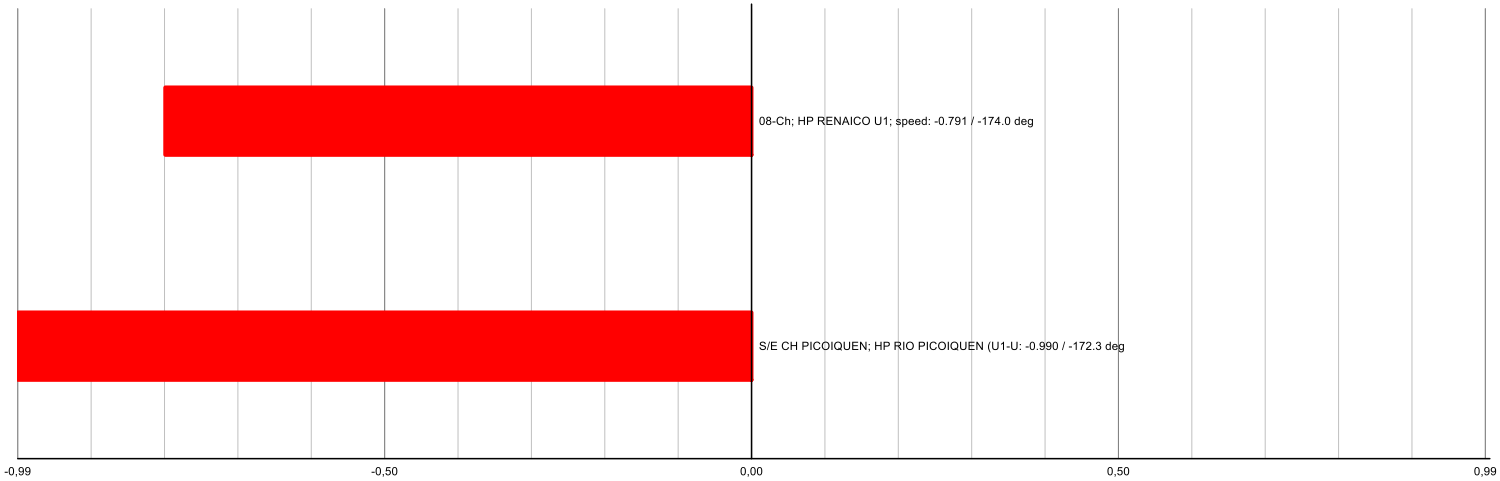
Annex: /62

Cluster 1:
S/E CH PICOIQUEN; HP RIO PICOIQUEN (U1-U: 0.00 / 120.8 deg

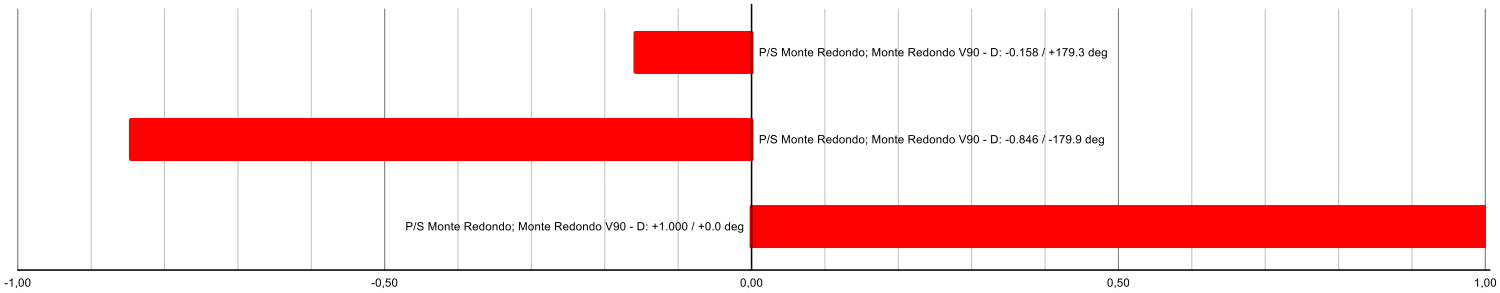


Observability of mode: -1,393 +18,609*j
Magnitude: 18,661 1/s, Angle: 94,280 deg
Period: 0,338 s, Frequency: 2,962 Hz
Damping: 1,393 1/s, Ratio of Amplitudes: 1,600

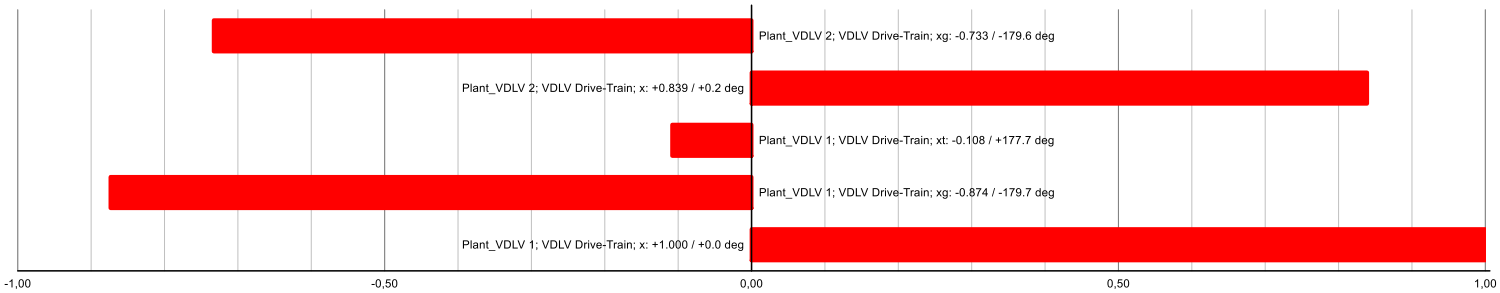
Cluster 2:
08-Ch; HP RENAICO U1; speed: 0.00 / 89.9 deg



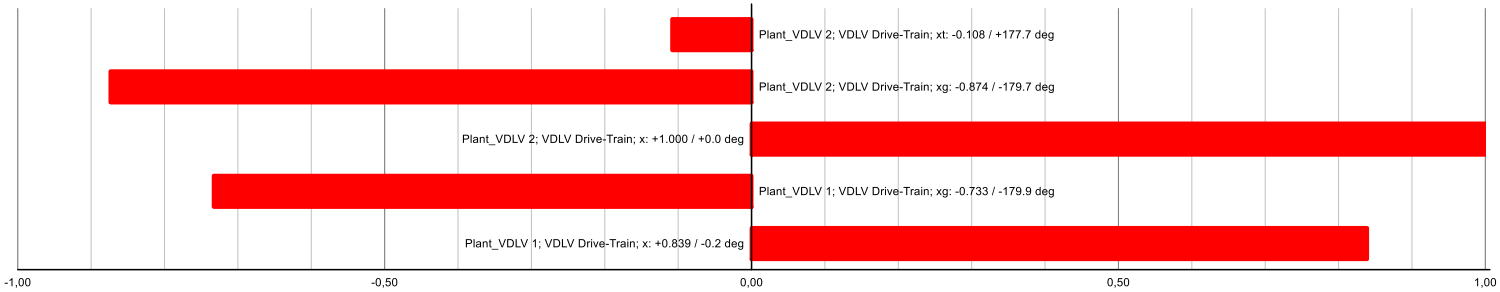
Participation of mode: -1,393 +18,609*j
Magnitude: 18,661 1/s, Angle: 94,280 deg
Period: 0,338 s, Frequency: 2,962 Hz
Damping: 1,393 1/s, Ratio of Amplitudes: 1,600
Min. contribution: 0,100



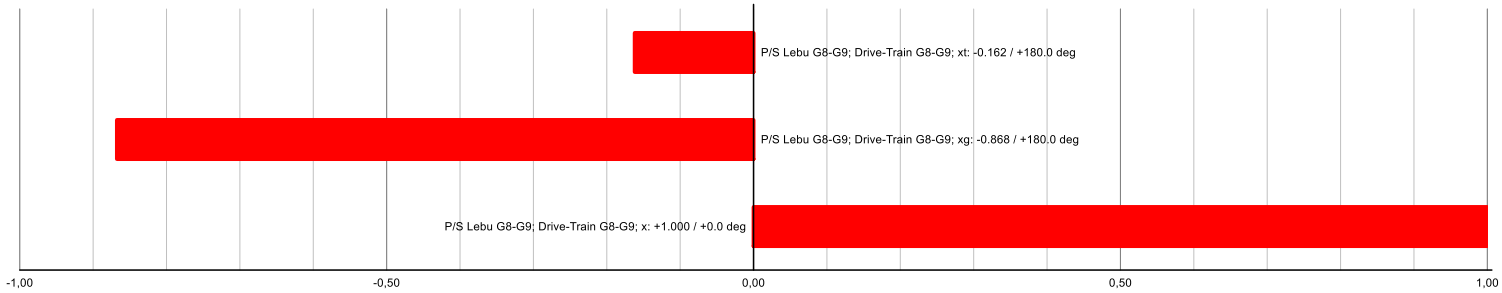
Participation of mode: -0,313 +9,750*j
Magnitude: 9,755 1/s, Angle: 91,839 deg
Period: 0,644 s, Frequency: 1,552 Hz
Damping: 0,313 1/s, Ratio of Amplitudes: 1,224
Min. contribution: 0,100



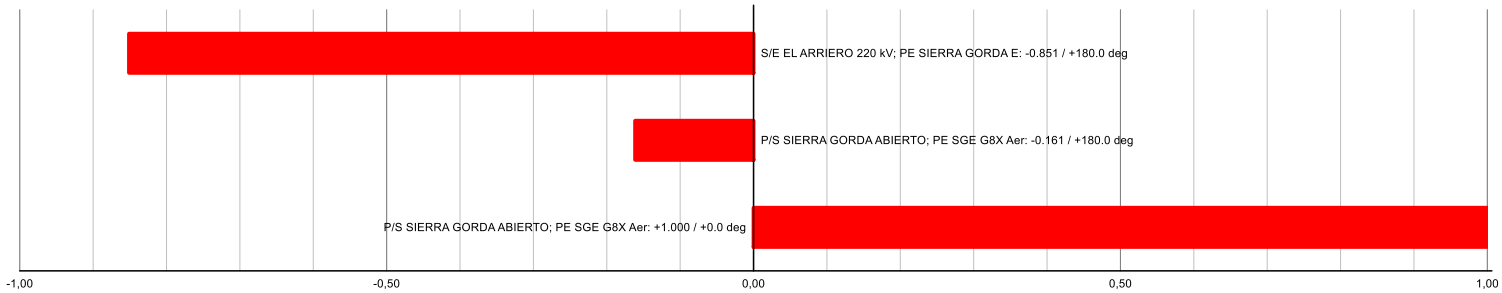
Participation of mode: -0,657 +12,486*j
Magnitude: 12,503 1/s, Angle: 93,014 deg
Period: 0,503 s, Frequency: 1,987 Hz
Damping: 0,657 1/s, Ratio of Amplitudes: 1,392
Min. contribution: 0,100



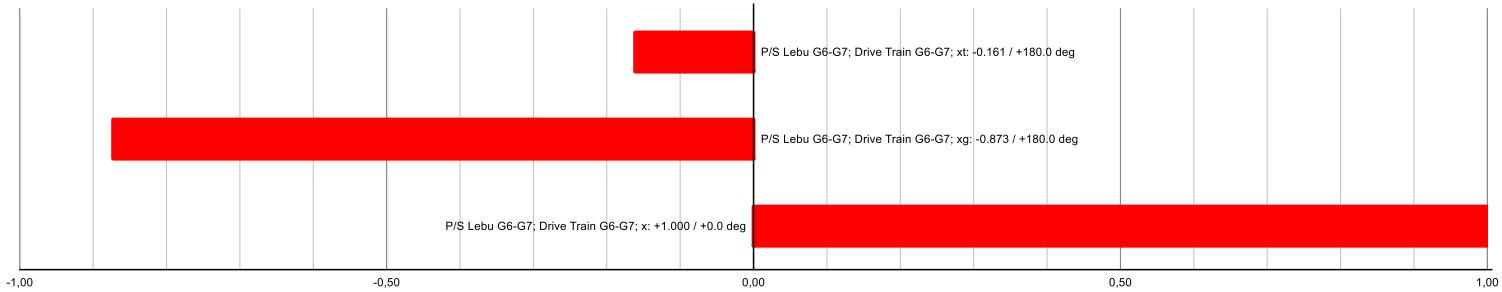
Participation of mode: -0,657 +12,486*j
Magnitude: 12,503 1/s, Angle: 93,014 deg
Period: 0,503 s, Frequency: 1,987 Hz
Damping: 0,657 1/s, Ratio of Amplitudes: 1,392
Min. contribution: 0,100



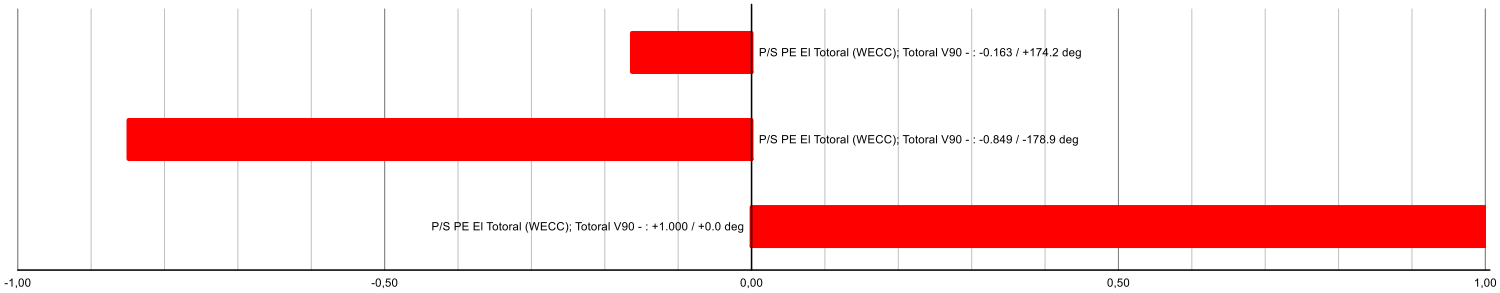
Participation of mode: -0,609 +11,090*j
Magnitude: 11,107 1/s, Angle: 93,142 deg
Period: 0,567 s, Frequency: 1,765 Hz
Damping: 0,609 1/s, Ratio of Amplitudes: 1,412
Min. contribution: 0,100



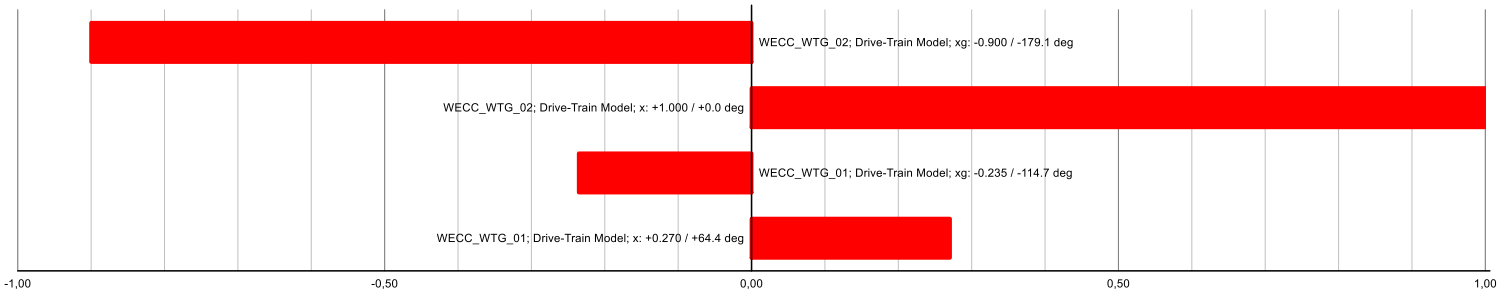
Participation of mode: -0,606 +9,778*j
Magnitude: 9,797 1/s, Angle: 93,546 deg
Period: 0,643 s, Frequency: 1,556 Hz
Damping: 0,606 1/s, Ratio of Amplitudes: 1,476
Min. contribution: 0,100



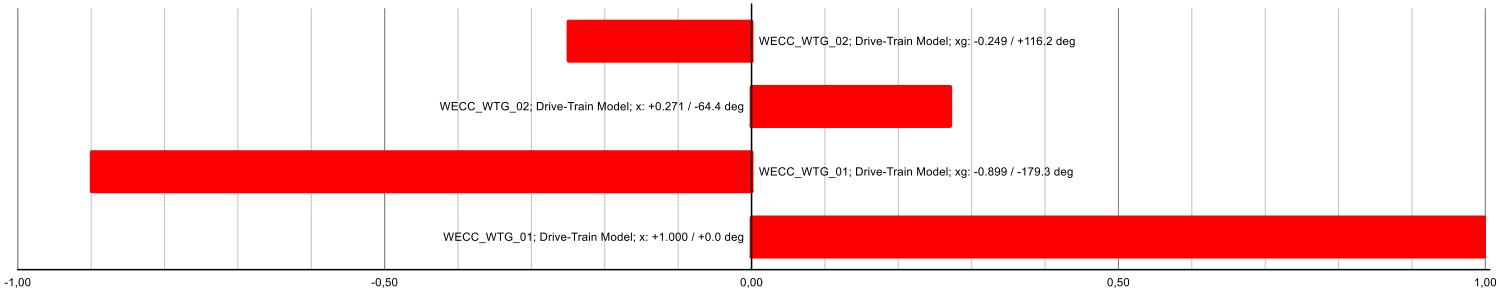
Participation of mode: -0,711 +11,104*j
Magnitude: 11,127 1/s, Angle: 93,662 deg
Period: 0,566 s, Frequency: 1,767 Hz
Damping: 0,711 1/s, Ratio of Amplitudes: 1,495
Min. contribution: 0,100



Participation of mode: -0,803 +9,761*j
Magnitude: 9,794 1/s, Angle: 94,702 deg
Period: 0,644 s, Frequency: 1,554 Hz
Damping: 0,803 1/s, Ratio of Amplitudes: 1,677
Min. contribution: 0,100

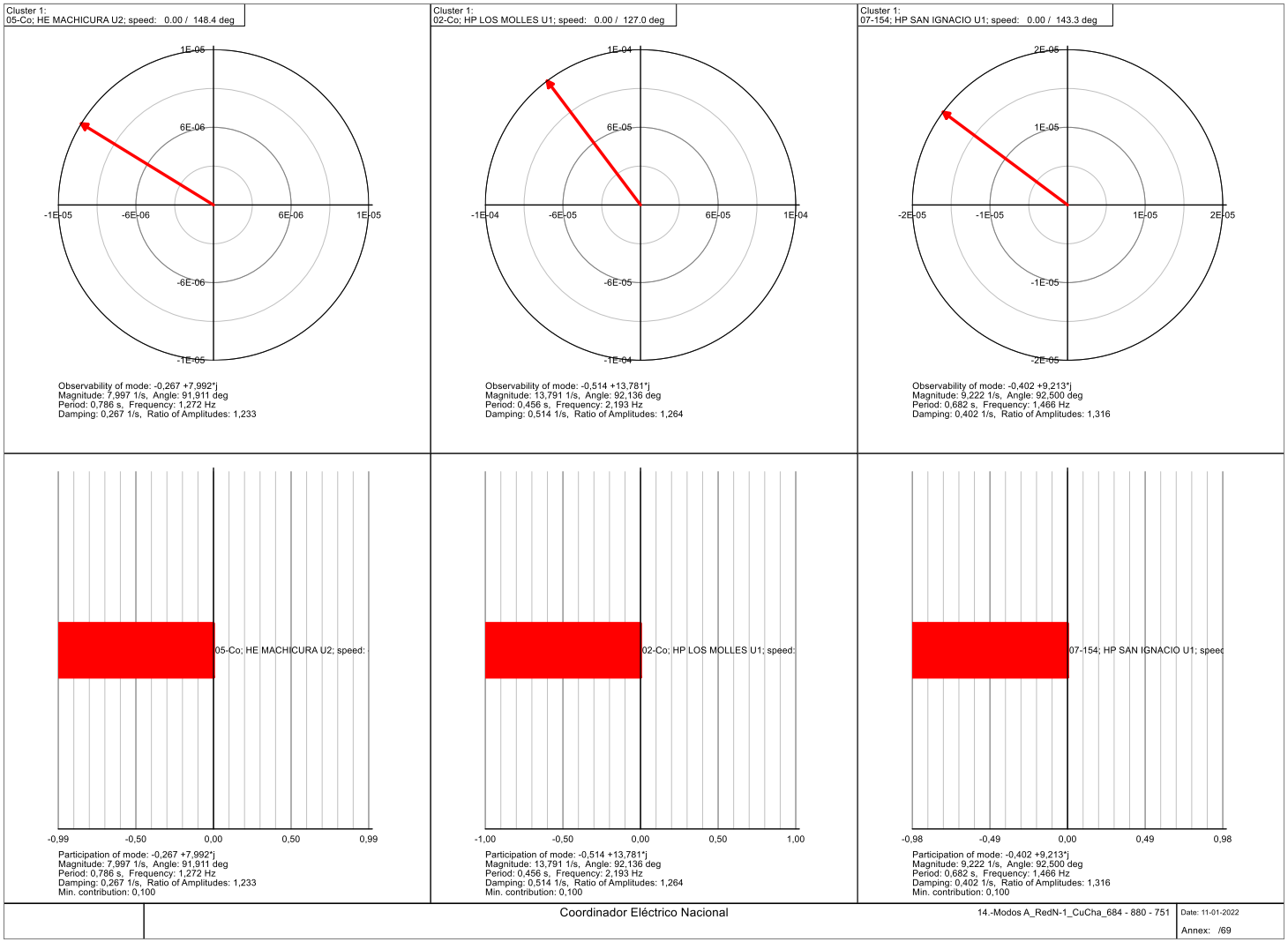


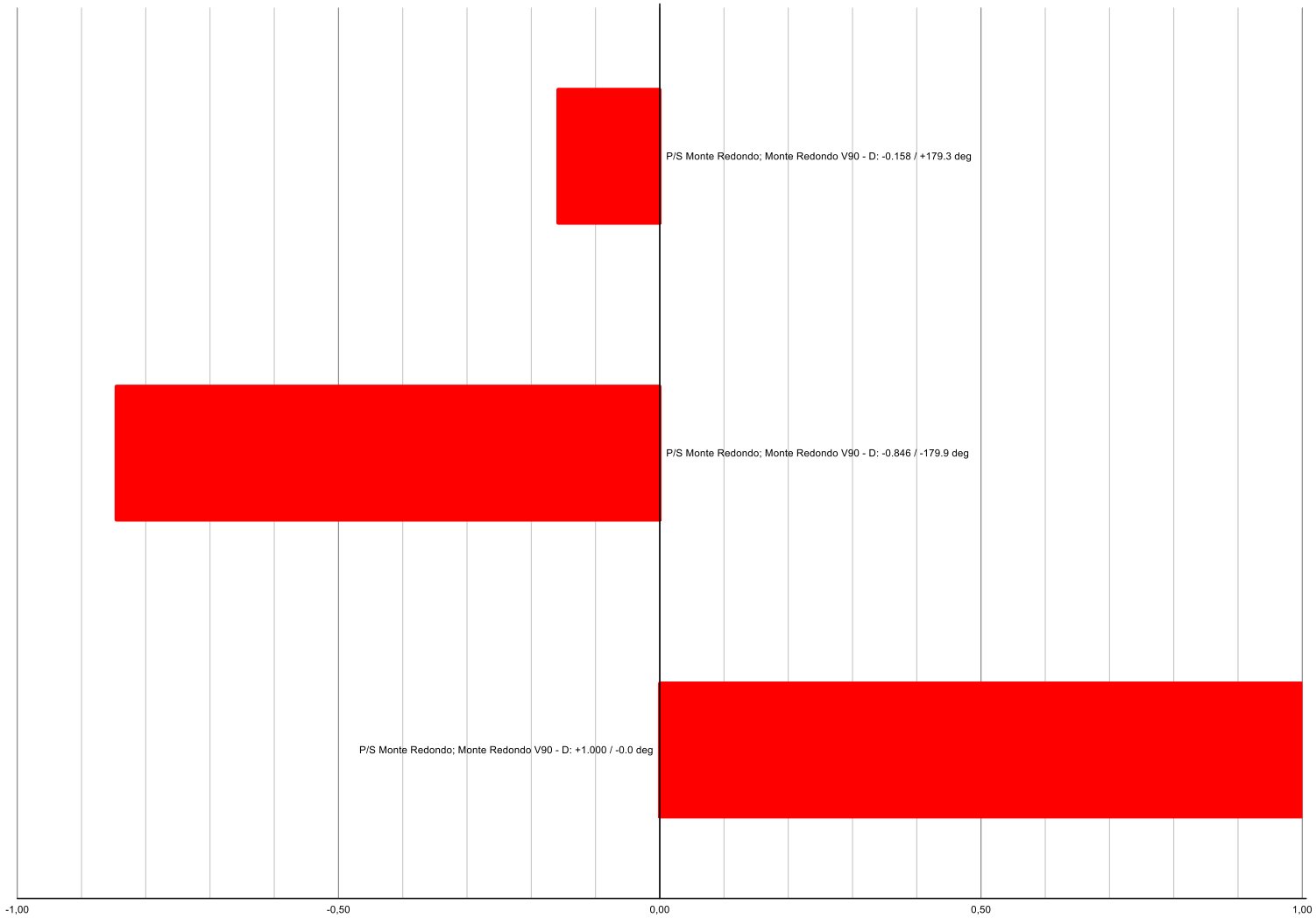
Participation of mode: -0,451 +5,317*j
Magnitude: 5,337 1/s, Angle: 94,848 deg
Period: 1,182 s, Frequency: 0,846 Hz
Damping: 0,451 1/s, Ratio of Amplitudes: 1,704
Min. contribution: 0,100



Participation of mode: -0,459 +5,305*j
Magnitude: 5,325 1/s, Angle: 94,946 deg
Period: 1,184 s, Frequency: 0,844 Hz
Damping: 0,459 1/s, Ratio of Amplitudes: 1,723
Min. contribution: 0,100

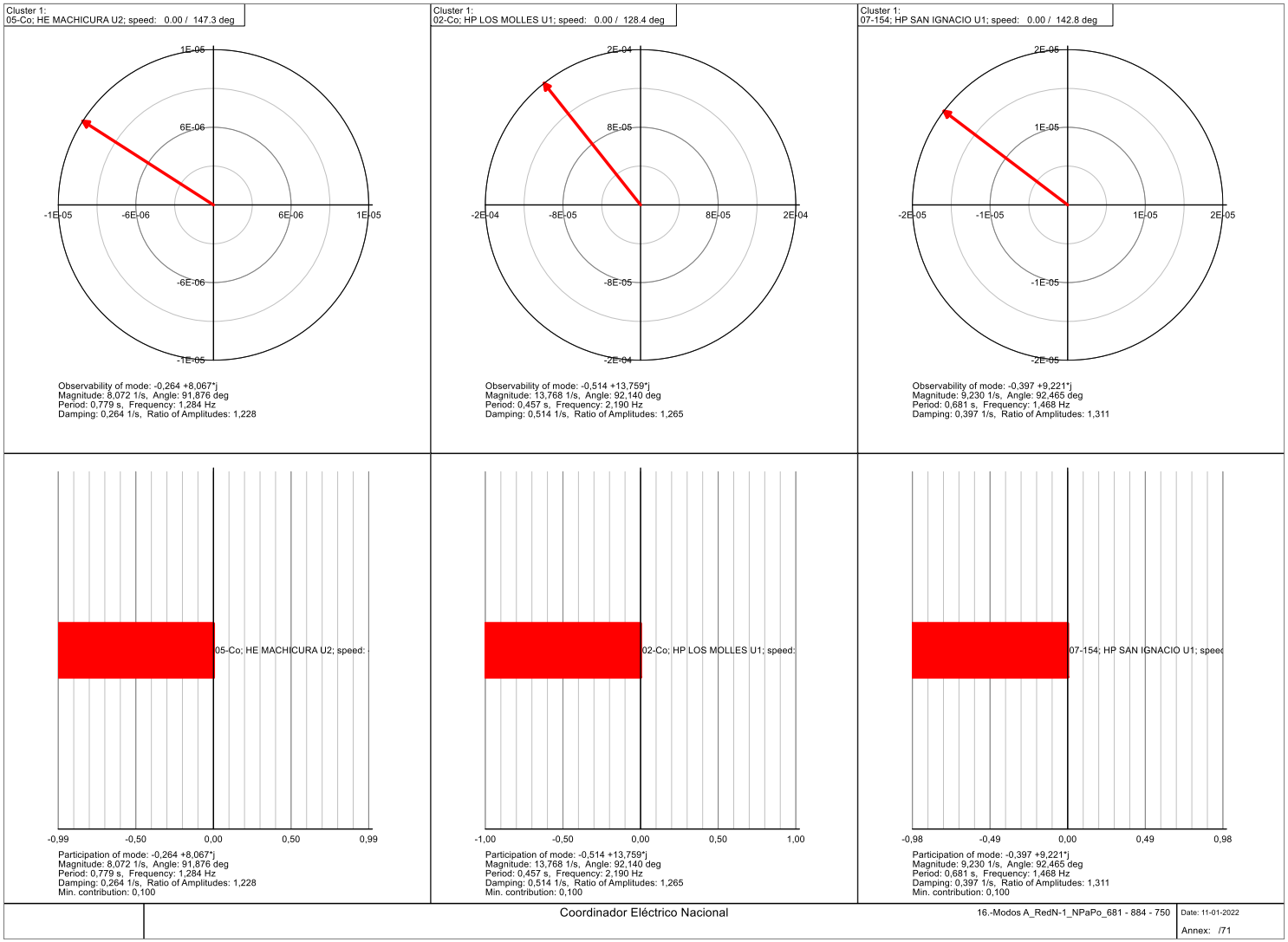
14.6.2 Red N-1 Caso 1.- Changos Cumbres 500 kV

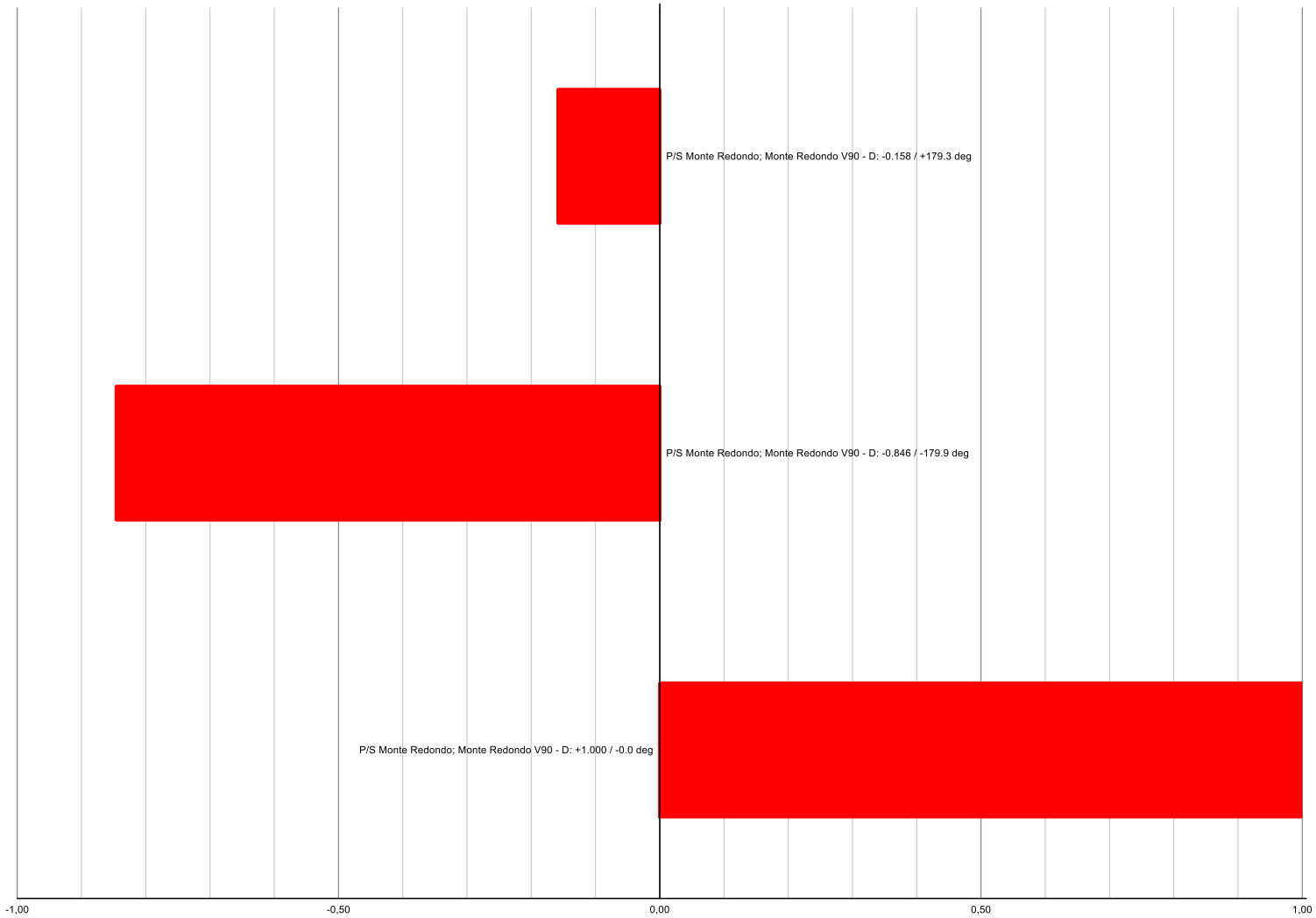




Participation of mode: -0,313 +9,750*j
Magnitude: 9,755 1/s, Angle: 91,839 deg
Period: 0,644 s, Frequency: 1,552 Hz
Damping: 0,313 1/s, Ratio of Amplitudes: 1,224
Min. contribution: 0,100

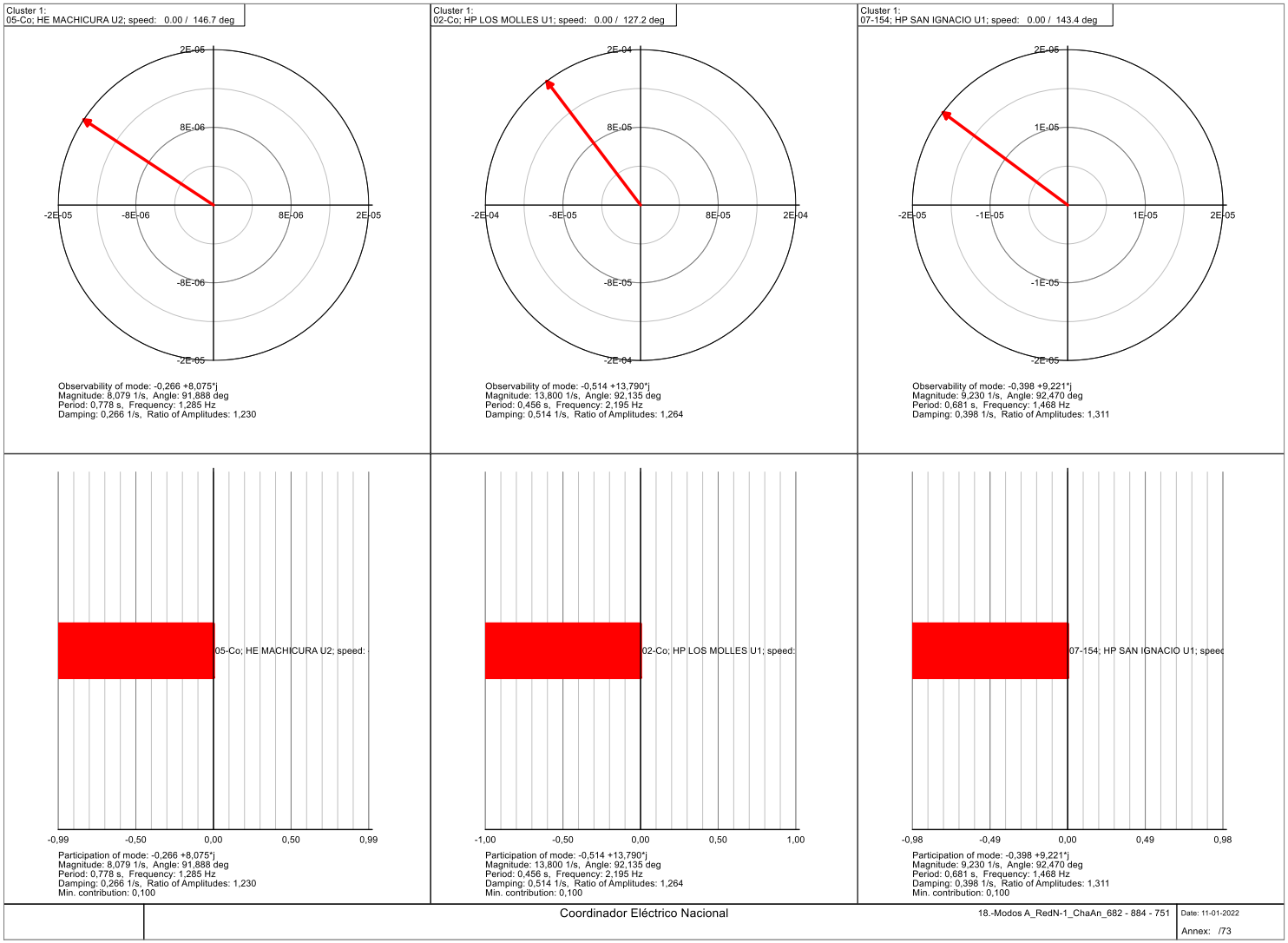
14.6.3 Red N-1 Caso 2.- Nueva Pan de Azúcar - Polpaico 500 kV

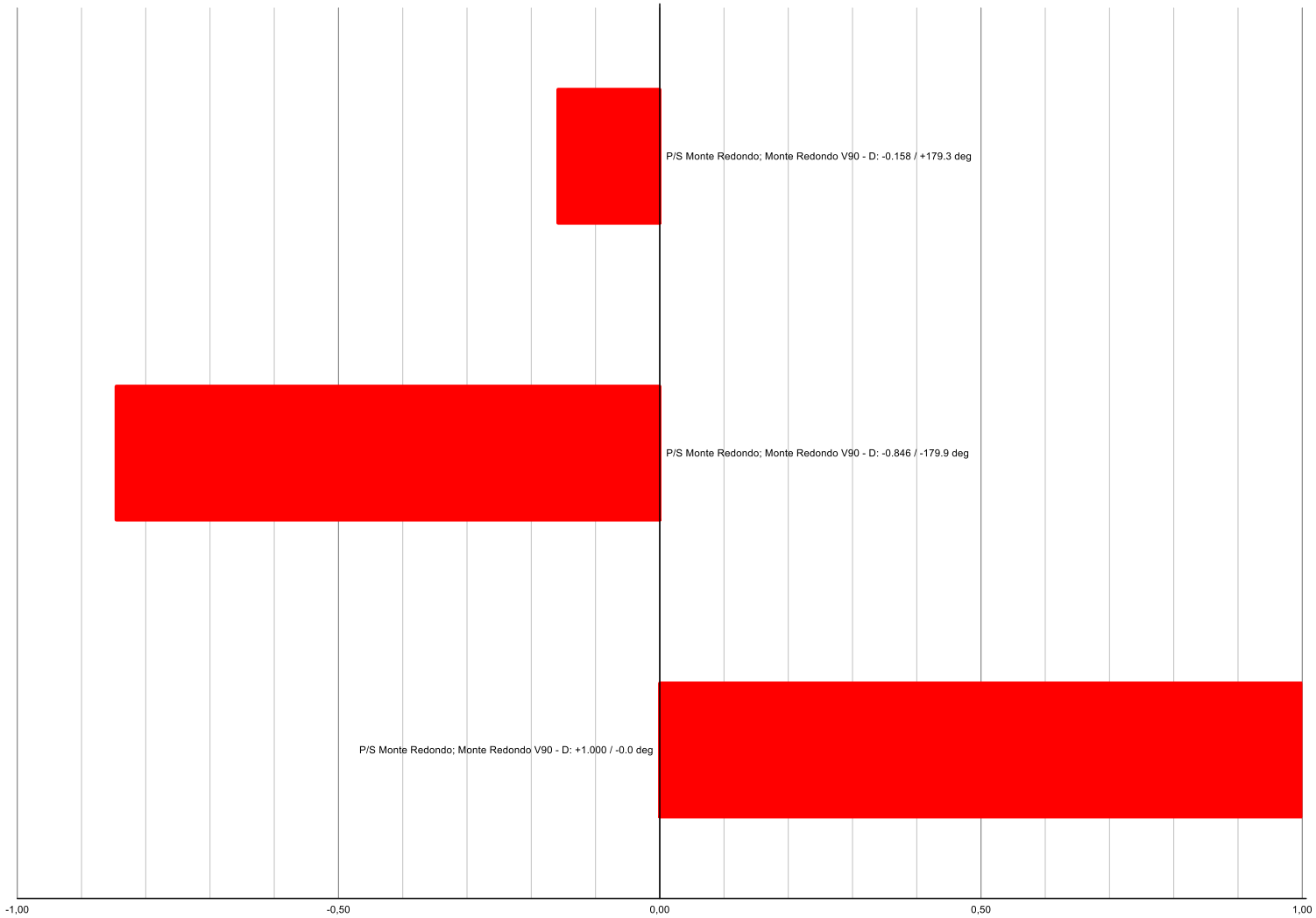




Participation of mode: -0,313 +9,750*j
Magnitude: 9,755 1/s, Angle: 91,839 deg
Period: 0,644 s, Frequency: 1,552 Hz
Damping: 0,313 1/s, Ratio of Amplitudes: 1,224
Min. contribution: 0,100

14.6.4 Red N-1 Caso 3.- Entre Ríos - Ancoa 500 kV





Participation of mode: -0,313 +9,750*j
Magnitude: 9,755 1/s, Angle: 91,839 deg
Period: 0,644 s, Frequency: 1,552 Hz
Damping: 0,313 1/s, Ratio of Amplitudes: 1,224
Min. contribution: 0,100

15 ANEXO 3: MODOS INESTABLES PSS F/S

15.1 Escenario E4 DA noche Mar2022