

**Supporting Information for
“Current Plate boundary deformation at the Azores triple junction determined from continuous GPS geodetic measurements (2002-2017)”**

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Introduction

This supporting information provides:

- a) Tables with known equipment changes in the CGPS stations, results including discontinuities, annual amplitudes and phases found in the CGPS time-series, and predicted Eurasian-Nubian plate velocities for the CGPS stations;
- b) Figures showing a time-series analysis example using FODITS program and all time-series of the CGPS stations in east, north and up components.

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Table 1. Equipment Changes in CGPS Stations

Station	Date	Receiver Type	Antenna Type	Antenna Height (m)
AZGR	2008/07/26	TRIMBLE NETR5	TRM55971.00 NONE	0.000
	2012/04/31	TRIMBLE NETR9	TRM55971.00 NONE	0.000
BVF1	2007/07/18	TRIMBLE NETRS	TRM29659.00 NONE	0.498
FLRS	2009/01/01	LEICA GRX1200GGPRO	LEIAT504GG NONE	0.498
FRNS	2008/04/16	LEICA GX1230GG	LEIAX1202GG NONE	0.498
HORT	2013/01/01	LEICA GX1230GG	LEIAR25 NONE	0.000
HTN1	2005/05/23	LEICA RS500	LEIAT504 NONE	0.861
	2006/02/15	TRIMBLE NETRS	TRM29659.00 NONE	0.571
	2007/07/18	LEICA GRX1200	LEIAT504 NONE	0.571
NOV1	2003/02/23	LEICA RS500	LEIAT504 LEIS	0.483
PCNG	2012/08/01	LEICA GRX1200	LEIAT504 NONE	0.485
	2013/02/15	LEICA RS500	LEIAT504 NONE	0.485
	2014/07/23	LEICA GR25	LEIAT504 NONE	0.485
PDEL	2001/11/06	LEICA CRS1000	LEIAT504 NONE	0.000
	2002/12/19	LEICA RS500	LEIAT504 NONE	0.000
	2008/04/06	LEICA GRX1200GGPRO	LEIAT504GG NONE	0.000
PTRP	2010/05/19	LEICA GRX1200GGPRO	LEIAT504GG LEIS	0.000
QBN1	2003/02/21	TRIMBLE 5700	TRM29659.00 TCWD	0.485
QEMD	2012 11 01	LEICA GRX1200GGPRO	LEIAT504 LEIS	0.000
RCHA	2005/02/01	ASHTECH Z-X	ASH701975.01A NONE	0.932
	2005/12/14	TRIMBLE NETRS	TRM29659.00 NONE	0.932
RIB1	2002/05/07	LEICA RS500	LEIAT504 LEIS	0.485
	2015/06/12	LEICA GR25	LEIAT504 LEIS	0.485
SRPC	2003/02/25	LEICA RS500	LEIAT504 LEIS	0.485
TERC	2008/09/18	LEICA GRX1200GGPRO	LEIAT504GG LEIS	0.000
VFDC	2009/07/14	LEICA GRX1200+GNSS	LEIAX1203+GNSS NONE	0.000

Table 2. Discontinuities of the CGPS Time-Series in East, North, and Up Components

Station	Date	Event	N(mm)	E(mm)	U(mm)	SD ^c (mm)
<i>AZGR</i>	2009/06/27	<i>Equipment^a</i>	2.0	3.1	7.8	0.3
<i>AZGR</i>	2013/11/17	<i>Equipment^a</i>	1.1	-1.2	4.4	0.3
<i>AZGR</i>	2015/06/25	<i>Equipment^a</i>	-0.0	-1.0	13.2	0.2
<i>BVF1</i>	2011/11/20	<i>Deformation</i>	-6.1	-0.8	2.5	0.4
<i>PDEL</i>	2006/12/12	<i>Equipment^a</i>	6.7	2.9	1.7	0.3
<i>PDEL</i>	2008/04/06	<i>Equipment</i>	2.3	-0.4	11.5	0.3
<i>PDEL</i>	2012/10/17	<i>Equipment^a</i>	-4.6	-4.4	-2.1	0.2
<i>PCNG</i>	2014/07/23	<i>Equipment^b</i>	2.1	-7.2	-9.9	0.4
<i>RCHA</i>	2005/12/14	<i>Equipment^b</i>	-21.7	-2.4	1.3	0.7
<i>RCHA</i>	2011/10/20	<i>Deformation</i>	-7.1	-4.4	5.1	0.4
<i>RIB1</i>	2005/06/05	<i>Deformation</i>	11.4	-9.4	-7.7	0.6
<i>SRPC</i>	2013/01/20	<i>Equipment^a</i>	-0.7	-5.6	-0.9	0.3
<i>HTN1</i>	2006/02/15	<i>Equipment</i>	1.8	1.1	7.4	0.6
<i>HTN1</i>	2007/07/18	<i>Equipment</i>	6.7	-4.3	-0.6	0.5

^a Unreported equipment change.^b Possible influence from volcano deformation.^c Global Standard Deviation.**Table 3.** Annual Amplitudes and Phases of the CGPS Time-Series in East, North, and Up Components

Station	Amplitude (mm)			Phase (°)		
	N	E	U	N	E	U
<i>AZGR</i>	1.8	1.0	1.4	165.3	23.3	-156.0
<i>BVF1</i>	1.8	1.0	1.1	172.4	16.4	178.8
<i>FLRS</i>	1.7	2.2	1.9	163.7	-17.5	-65.5
<i>FRNS</i>	2.1	1.1	1.8	171.6	1.9	173.3
<i>HTN1</i>	2.2	0.8	3.7	-165.1	17.6	142.9
<i>NOV1</i>	1.5	1.4	0.7	170.9	3.2	164.9
<i>PBOI</i>	2.7	1.2	2.8	164.7	81.8	130.8
<i>PDEL</i>	2.0	1.0	2.1	163.2	-2.6	174.4
<i>PIED</i>	2.2	1.3	0.5	159.5	2.7	-92.0
<i>PCND</i>	2.5	0.9	1.6	173.2	20.1	94.1
<i>PCNG</i>	2.1	1.5	0.7	145.2	24.4	-161.0
<i>PTRP</i>	2.2	1.3	2.2	143.0	42.1	141.9
<i>QBN1</i>	1.9	1.4	1.2	157.5	20.9	-178.3
<i>RCHA</i>	2.4	1.2	1.1	162.3	46.7	136.9
<i>RIB1</i>	1.8	1.4	1.3	164.5	17.8	152.8
<i>SRPC</i>	2.1	1.0	2.1	151.1	52.9	158.9
<i>TERC</i>	2.3	1.2	1.4	145.1	-5.9	-102.3
<i>VFDC</i>	2.2	1.3	0.4	158.7	35.4	-172.5

Table 4. Eurasian-Nubian Plate Motion for Plate Motion Models ITRF2008, GEODVEL2010 and MORVEL2010

Model	Full Plate Velocities (mm yr ⁻¹)			Azimuth (°)
	East	North	Speed	
<i>ITRF2008</i>	4.2 ^{+0.1} _{-0.0}	0.6 ^{+0.3} _{-0.1}	4.3 ^{+0.1} _{-0.0}	81.9 ^{+0.7} _{-3.9}
<i>GEODVEL</i>	4.8 ^{+0.1} _{-0.0}	0.5 ^{+0.3} _{-0.1}	4.8 ^{+0.1} _{-0.0}	83.5 ^{+0.7} _{-3.9}
<i>MORVEL</i>	4.0 ^{+0.3} _{-0.0}	1.2 ^{+0.7} _{-0.1}	4.2 ^{+0.4} _{-0.0}	72.7 ^{+1.7} _{-8.0}

Plate motion is calculated at the average location of all CGPS stations located to east of MAR (-26.556°E 38.187°N).

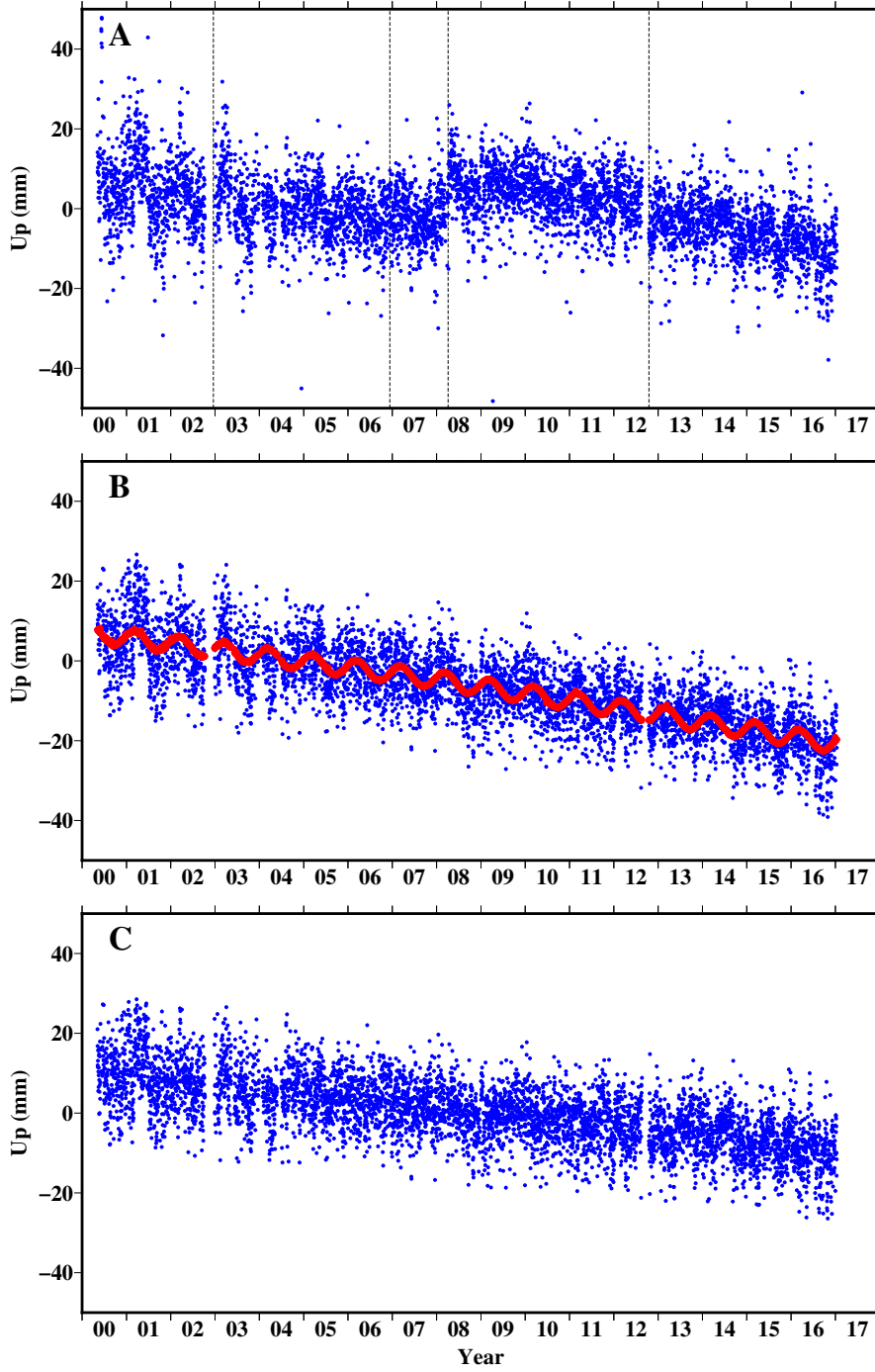


Figure 1. Time-series of the vertical component of PDEL station for the period between May 2000 and January 2017, relative to ITRF2008 reference frame with A) all solutions from Bernese 5.2 processing before the time-series analysis using FODITS program, B) solutions with filtered out discontinuities and outliers found from FODITS program analysis, and C) filtered solutions from discontinuities, outliers and seasonal signals found from FODITS program analysis.

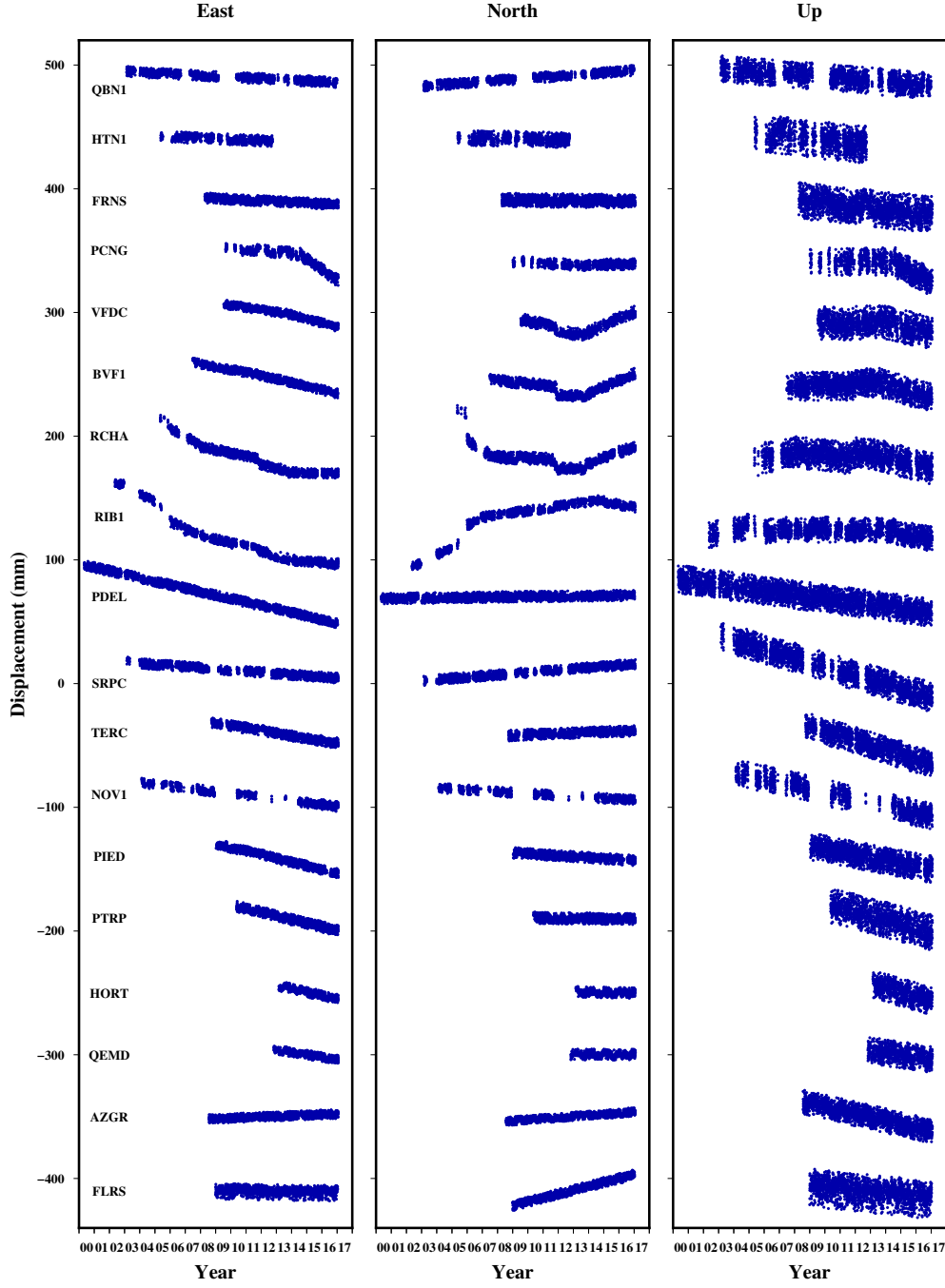


Figure 2. Time-series of the CGPS stations in east, north, and up components for the period between May 2000 and January 2017, relative to ITRF2008 plate motion model. The time-series of FLRS site are relative to predicted North American plate motion, while all others are relative to predicted Eurasian plate motion.