

3rd reprocessing campaign

Andreja Susnik, Andrea Maier and
Rolf Dach

Introduction



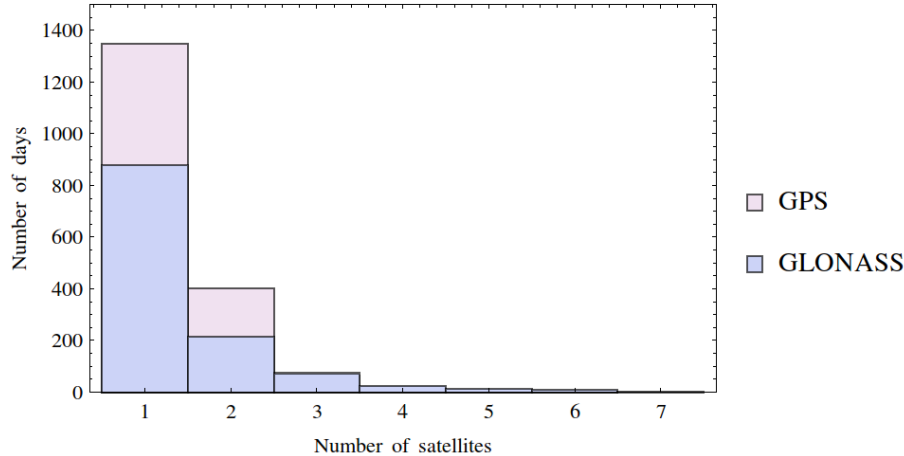
- time span of reprocessing campaign is between January 1994 and December 2013
- GPS-only from January 1994 to December 2001 and GPS/GLONASS combined from January 2002 to December 2013
- number of stations per day between approx. 40 in 1994 and approx. 270 in 2013 (based on 2nd reprocessing campaign)

Introduction

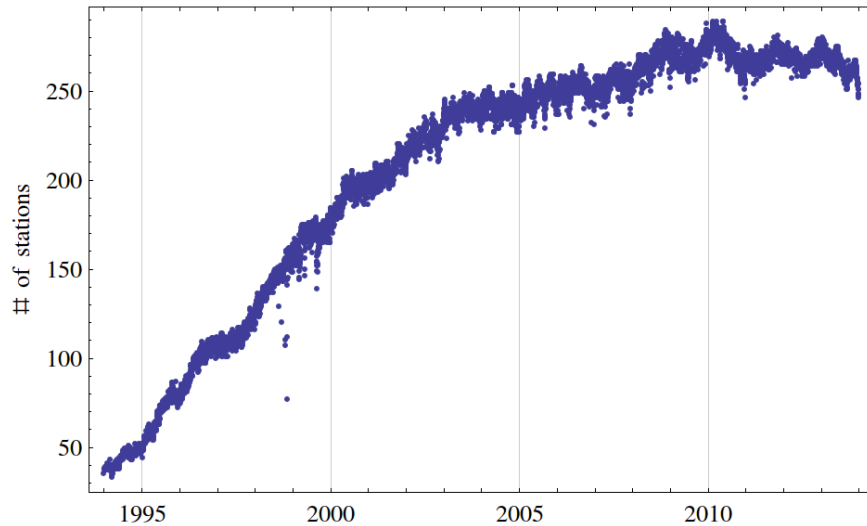


- time span of reprocessing campaign is between January 1994 and December 2013
- GPS-only from January 1994 to December 2001 and GPS/GLONASS combined from January 2002 to December 2013
- number of stations per day between approx. 40 in 1994 and approx. 270 in 2013 (based on 2nd reprocessing campaign)
- first step was to complete necessary input data (RINEX observation files and a priori orbits from previous reprocessing campaigns, CODE operational processing and other AC's)
- second step was to cross-check and complete station equipment changes for all stations between 1994-2013 period

Introduction



Number of sat.	GPS	GLONASS
1	1349	879
2	403	215
3	64	73
4	11	23
5	5	12
6	1	8
7	0	1



- number of stations (based on 2nd reprocessing campaign)

Introduction



1 – day solution

Figure 1: Schematic presentation of the individual solutions in CODE reprocessing.

Introduction

1 – day solution



1 – day NEQs
f1_yyydd.PRE
f1_yyydd.ERP
f1_yyydd.CRD
f1_yyydd.TRP
f1_yyydd.CLK

Figure 1: Schematic presentation of the individual solutions in CODE reprocessing.

Introduction

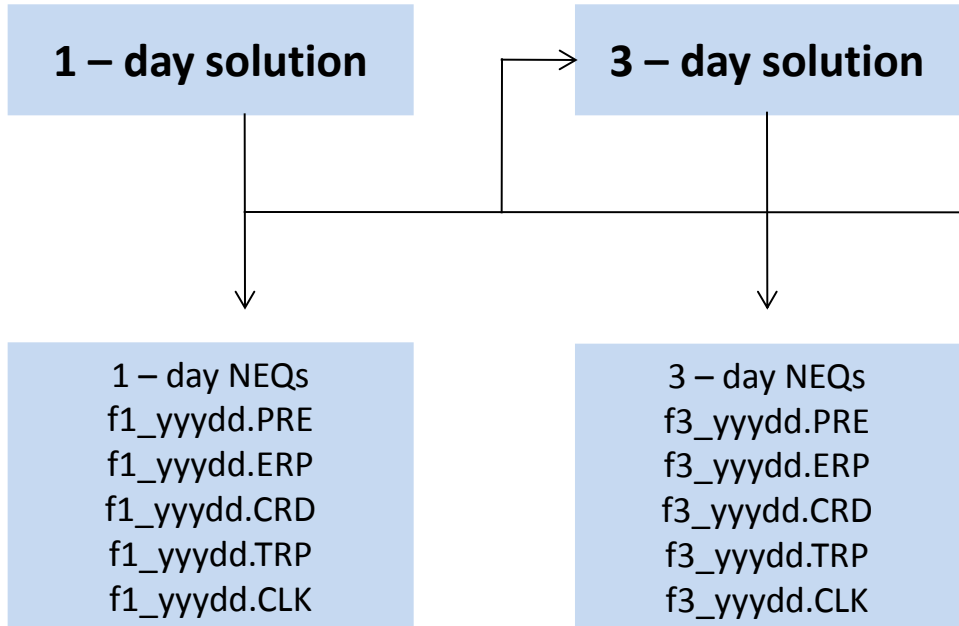


Figure 1: Schematic presentation of the individual solutions in CODE reprocessing.

Introduction

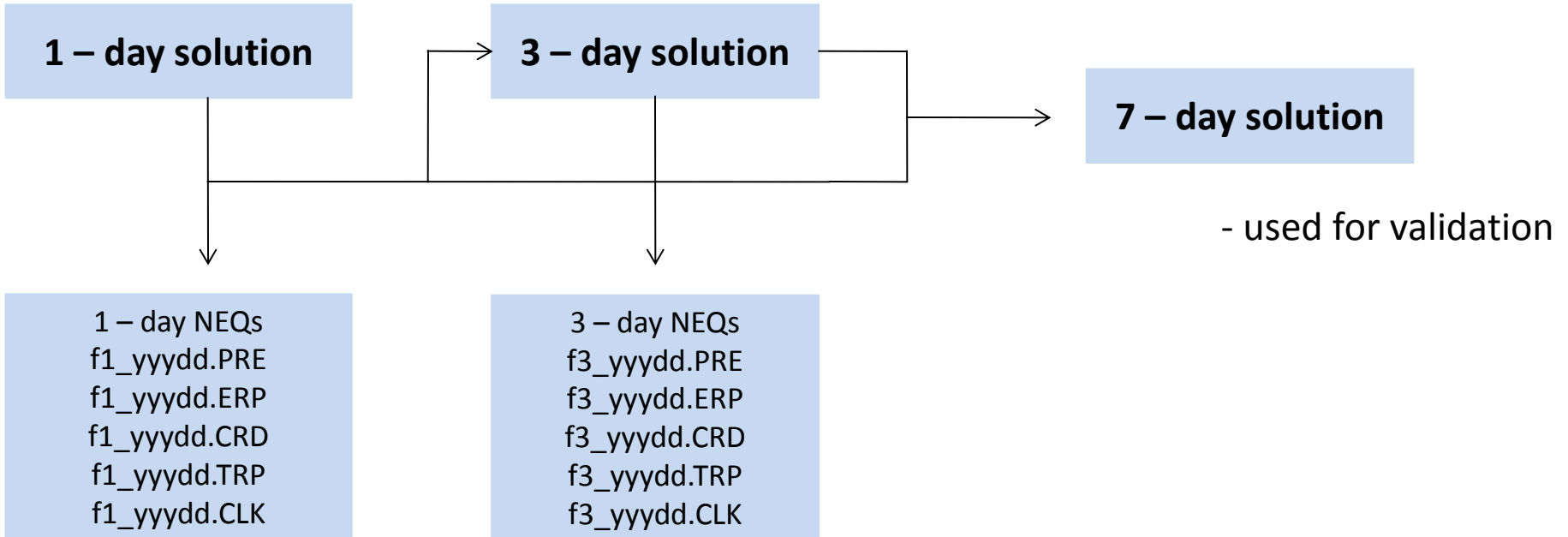


Figure 1: Schematic presentation of the individual solutions in CODE reprocessing.

Introduction

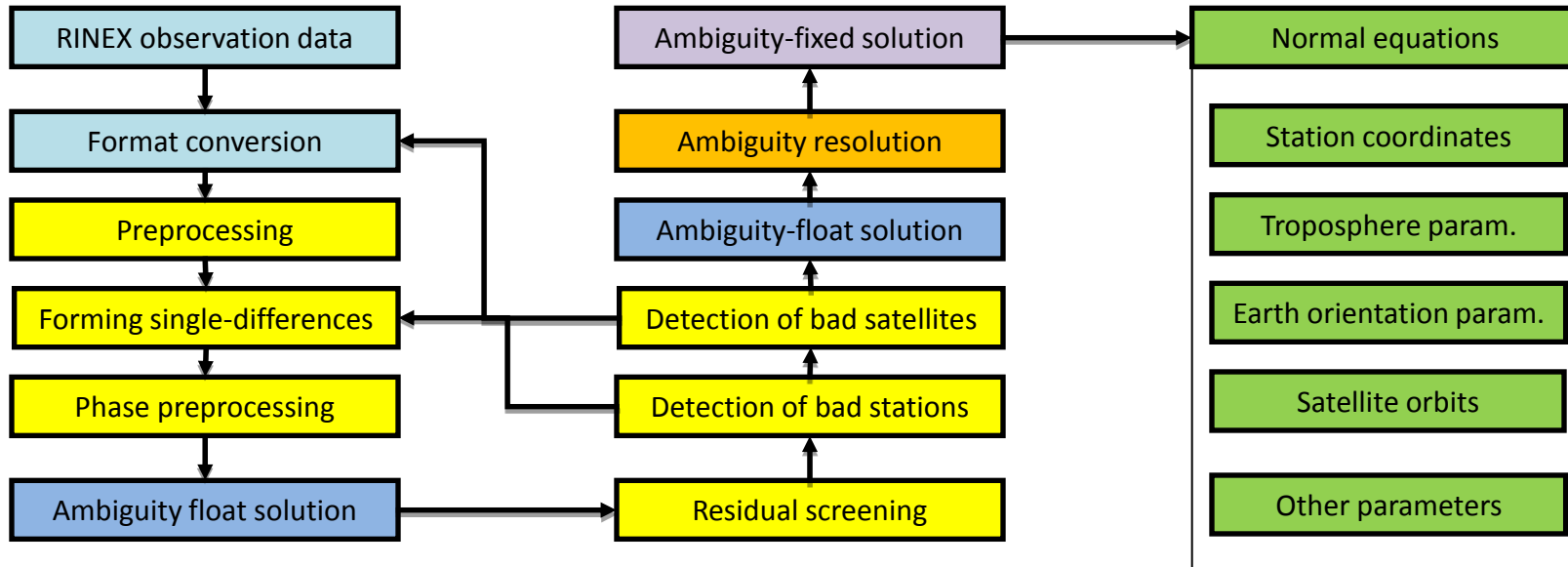


Figure 2: Simplified flowchart of the 1-day solutions.

Current status

	2013	2012	2011	2010	2009
Preparation steps	✓	✓	✓	✓	✓
1-day solution	✓	✓	✓	✓	
3-day solution	✓	✓	✓		
CLK					
7-day solution					

- ✓ - finished (note that preparation process completed also for the period 1994-2008 !)
- ✓ - process currently running (currently 170 days already done)
- ✓ - analysis of time series to identify outliers in coordinate series performed

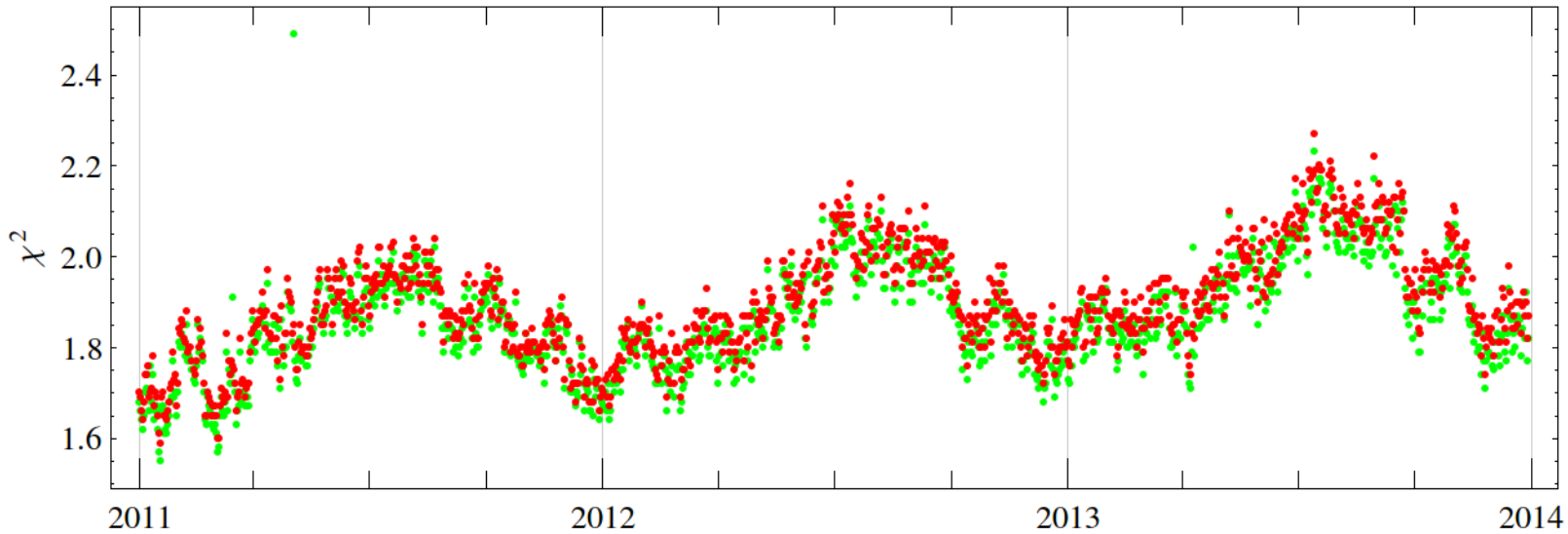
Current status

- after 1-day solution for a specific year is obtained, a detailed cross-check with previous reprocessing campaign is performed
- several different parameters are taken into consideration:
 - Total number of observations
 - Total number of satellites
 - Total number of stations
 - Number of ambiguities
 - A posteriori RMS of unit weight
 - Chi-Squared Distribution
 - Total number of observation files
 - RMS of Transformation

Current status

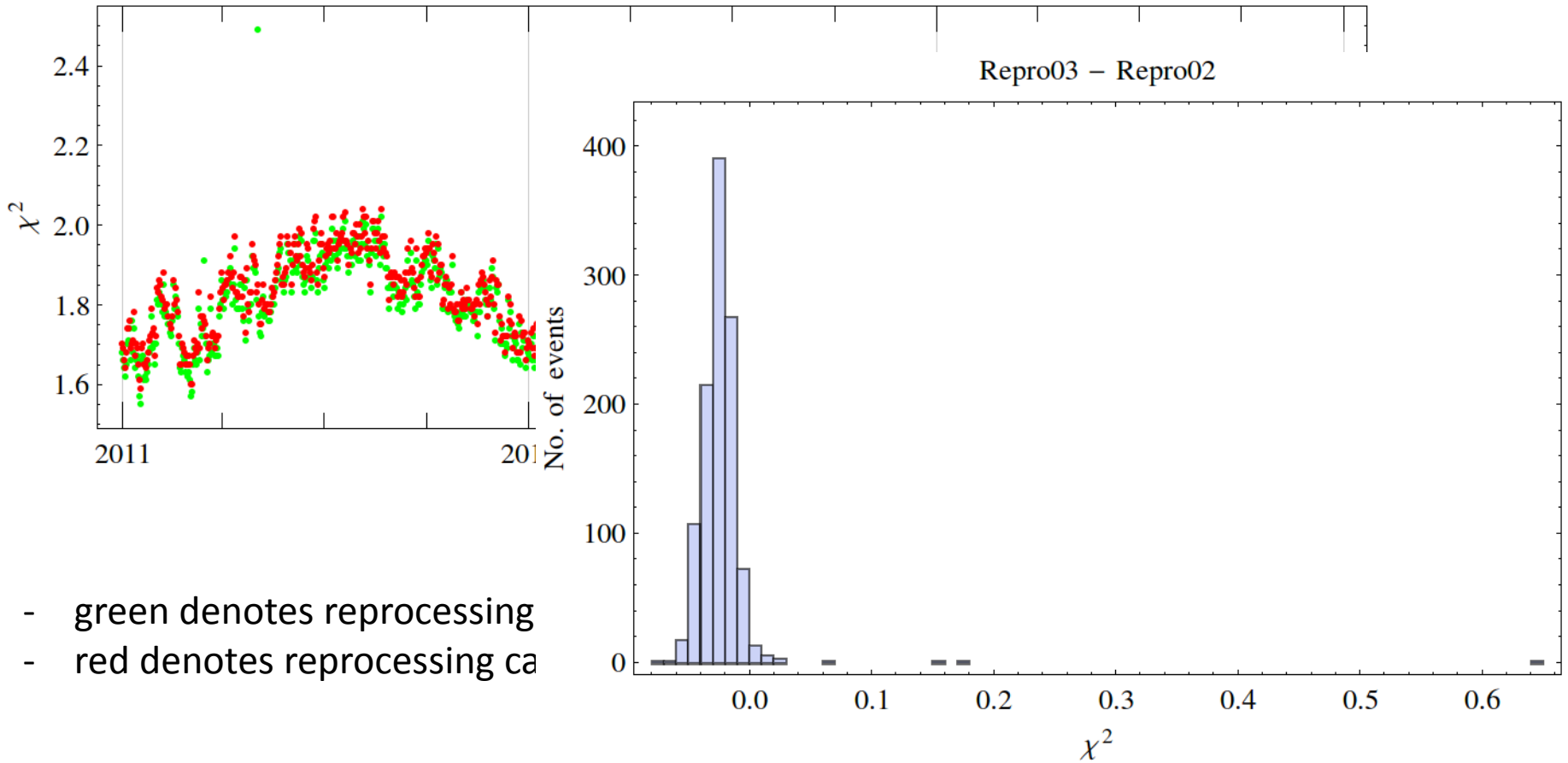
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 - RMS of Transformation
- additionally validation of microwave-based GNSS orbits using Satellite Laser Ranging (SLR) measurements

Current status

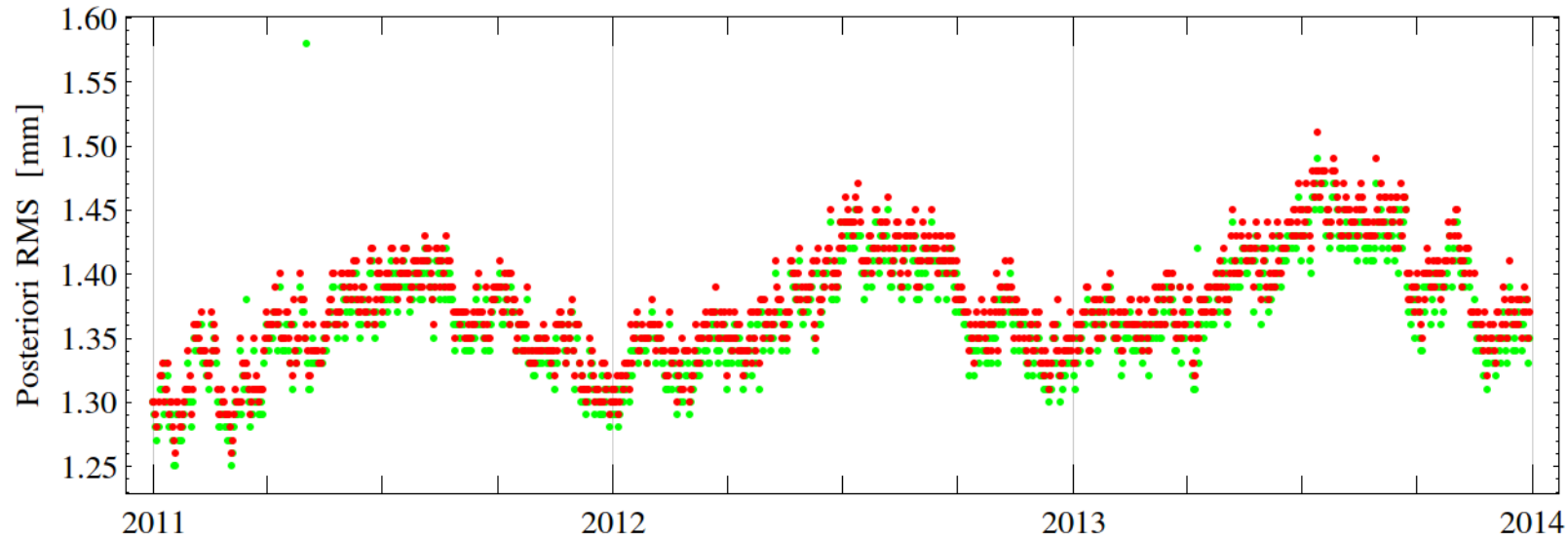


- green denotes reprocessing campaign 3
- red denotes reprocessing campaign 2

Current status

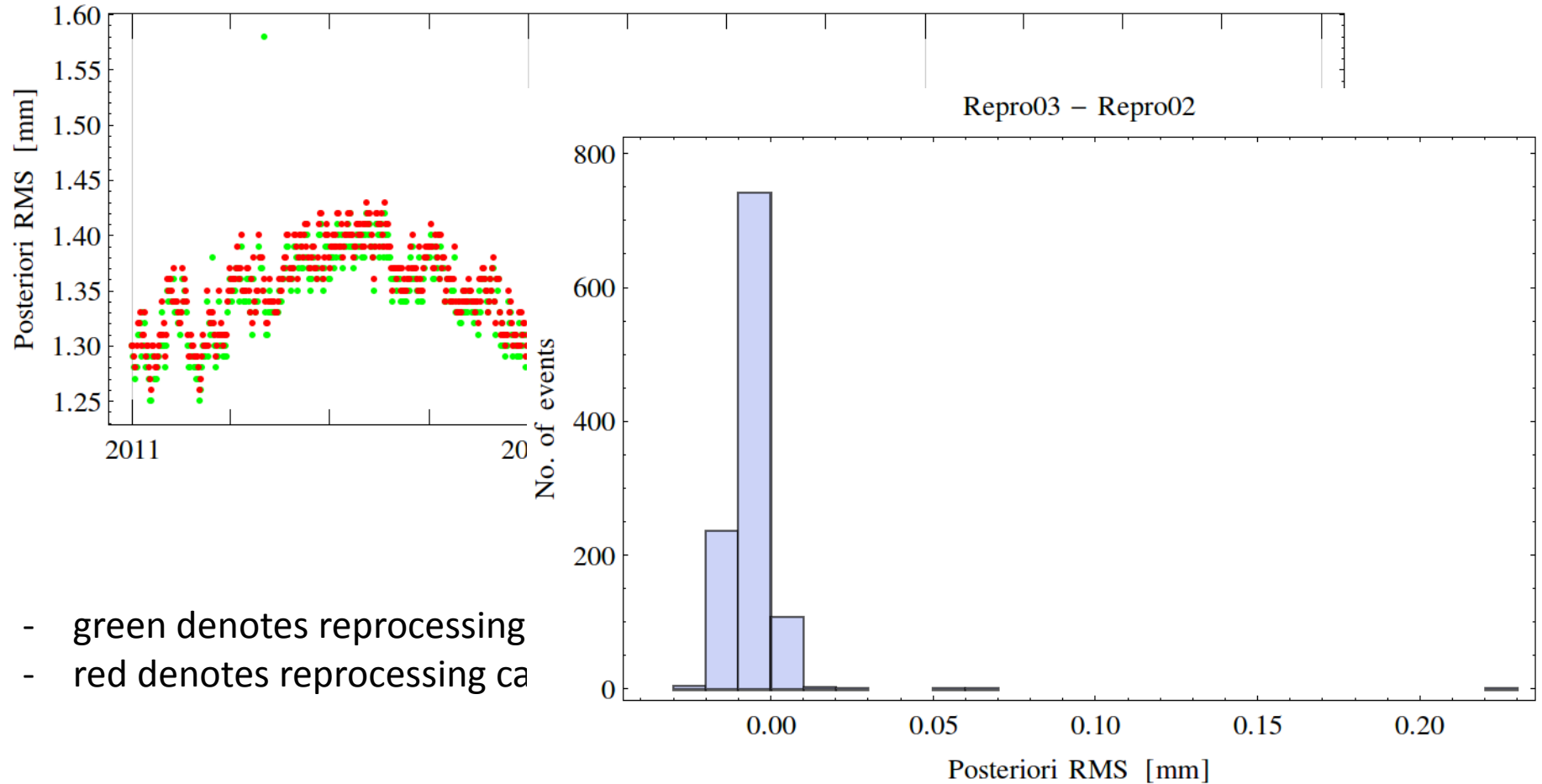


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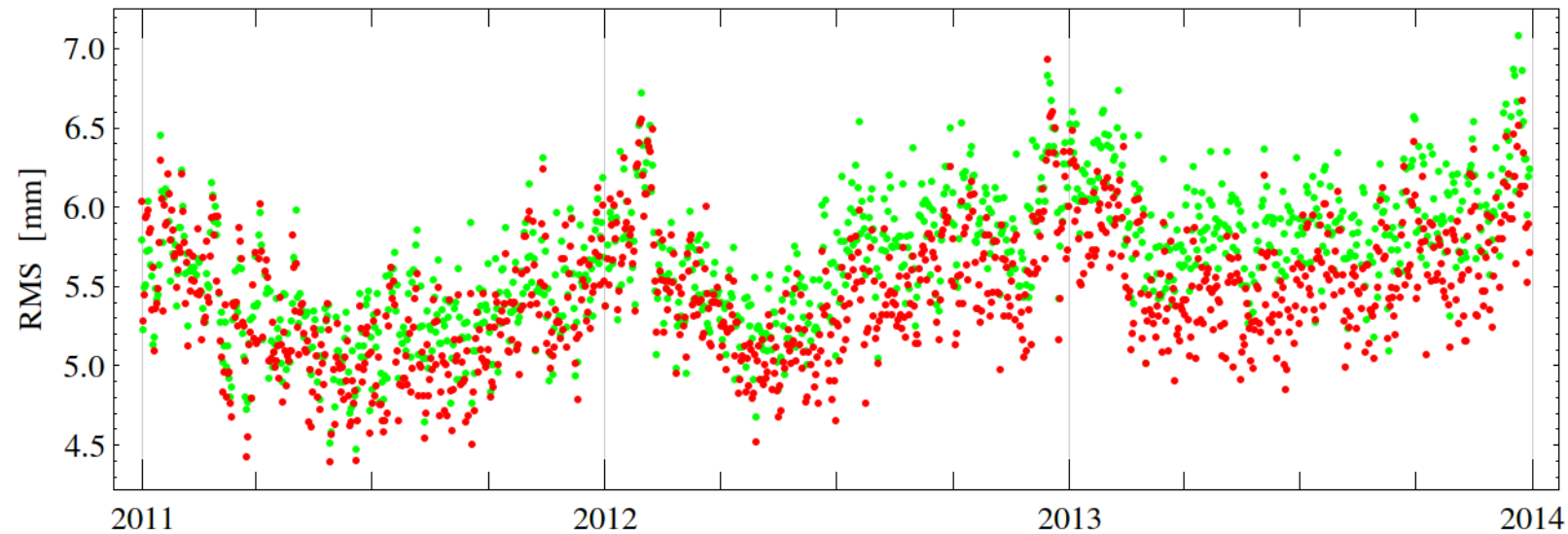


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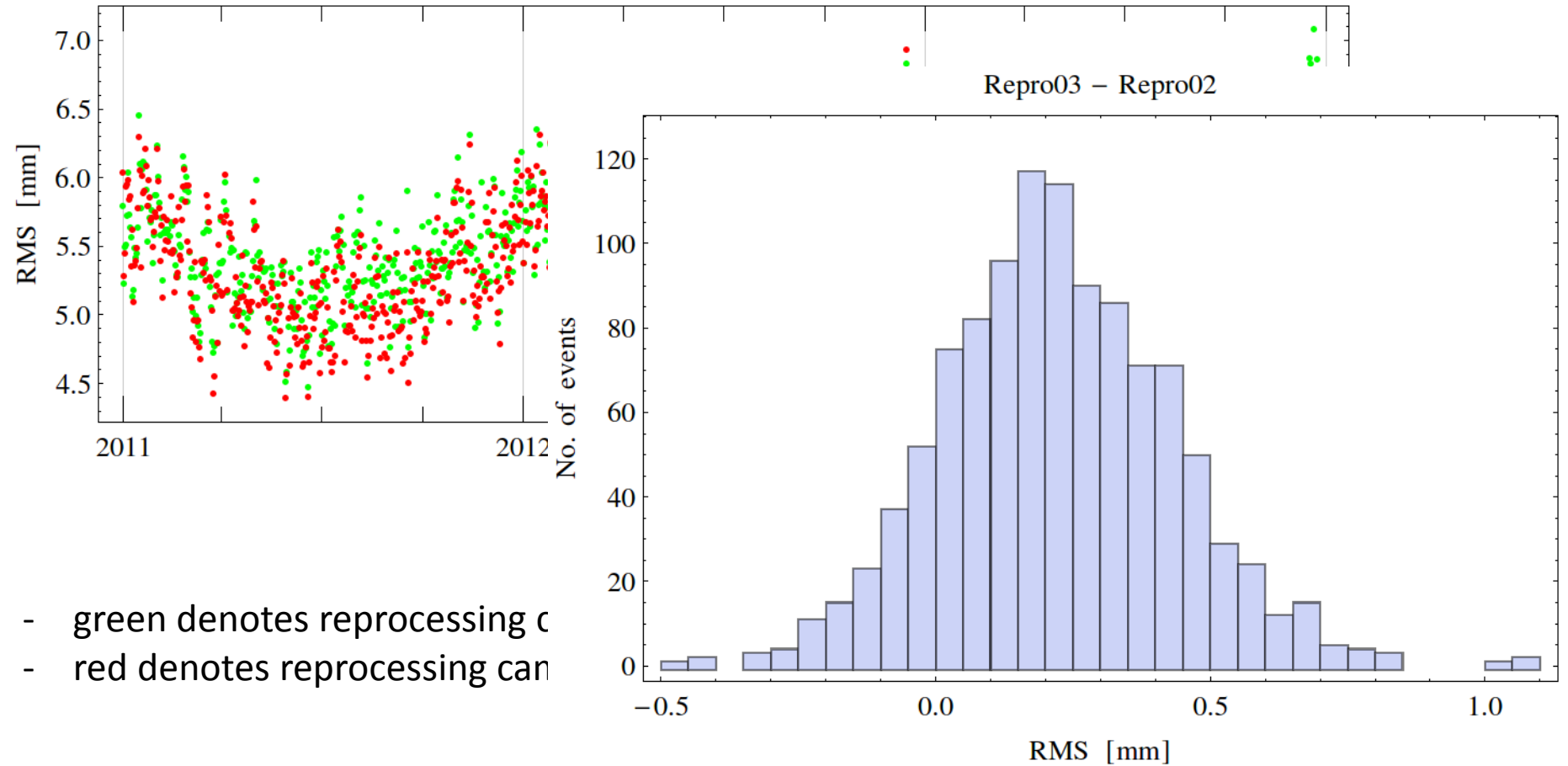


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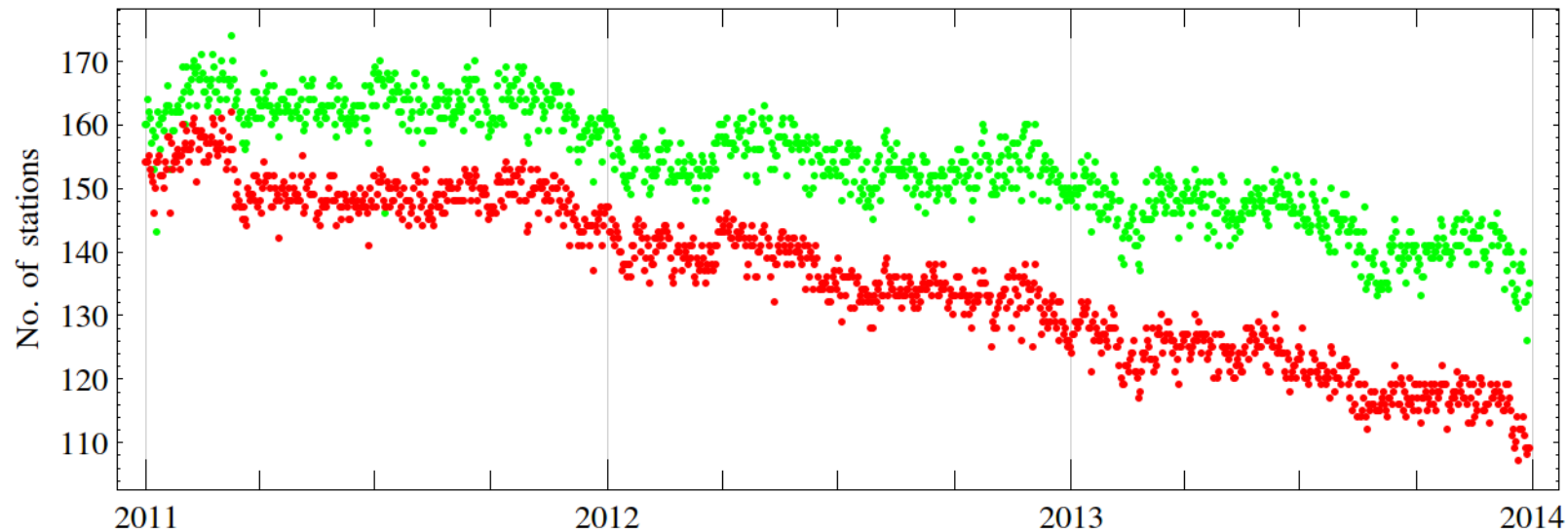


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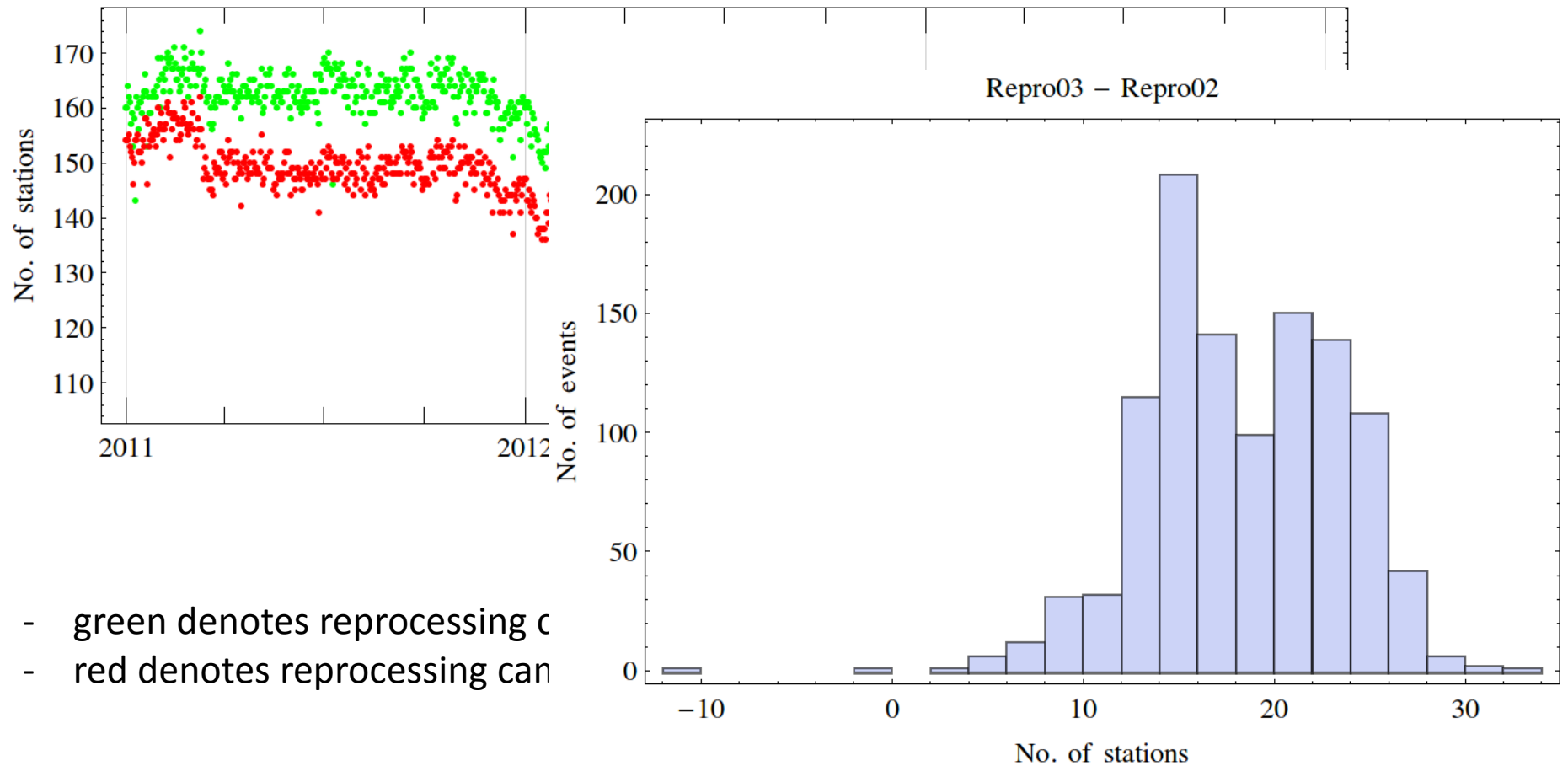


Current status



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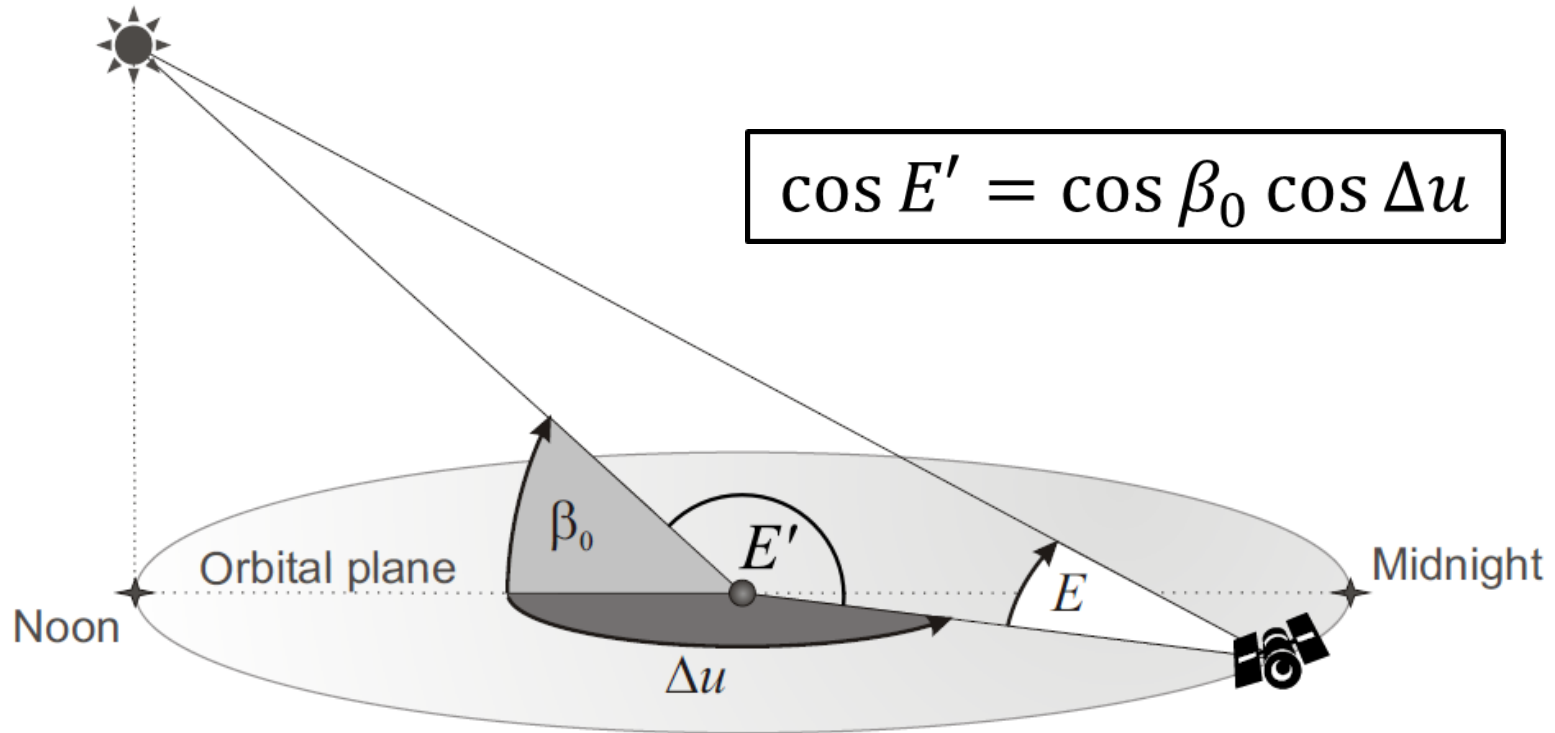
Current status



Validation of GNSS orbits (1)

- validation of microwave-based GNSS orbits using Satellite Laser Ranging (SLR) measurements
- 3 years (2011, 2012, 2013) analyzed so far
- residuals ('observed' minus 'computed')
 - 'observed' ... SLR observation to GNSS satellite
 - 'computed' ... range to GNSS orbit computed at AIUB
- no parameters are estimated

Validation of GNSS orbits (2)



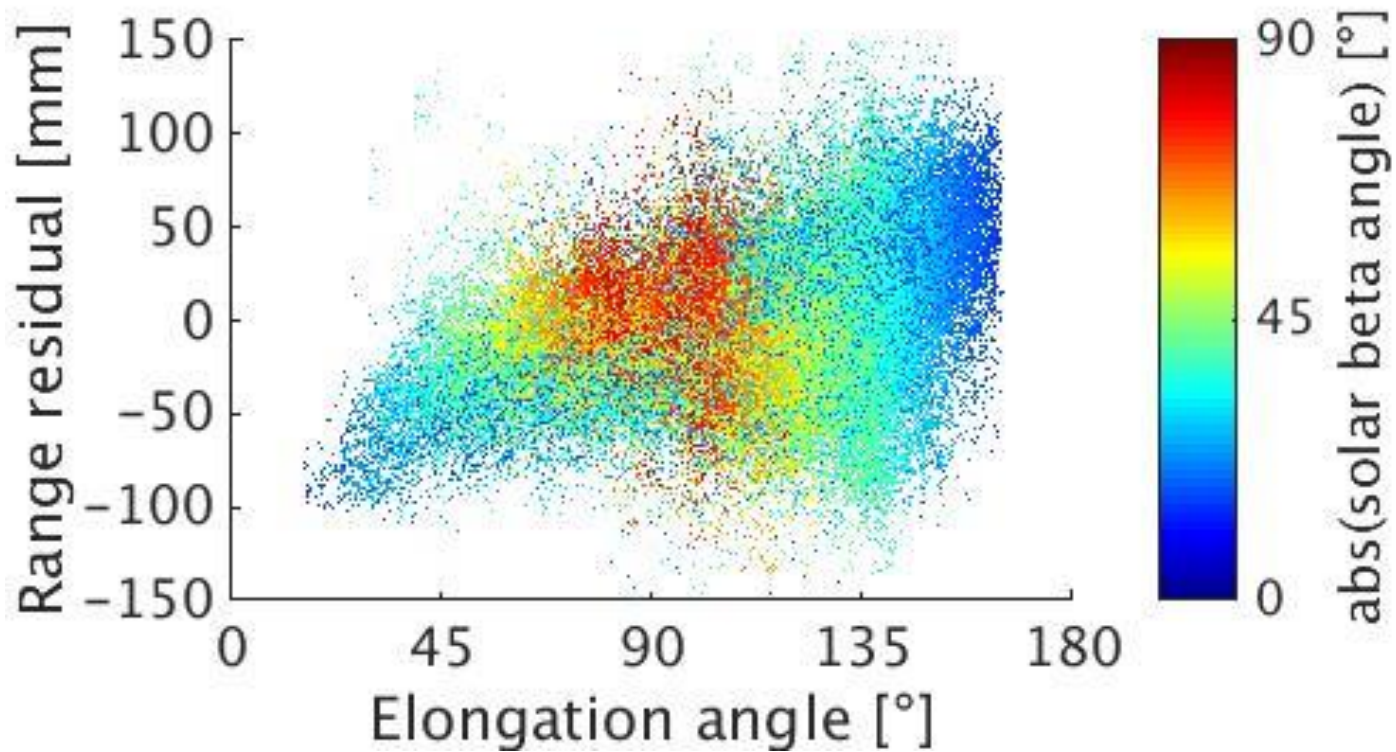
E' ... elongation angle

β_0 ... solar beta angle

Δu ... argument of latitude of the satellite w.r.t. the Sun

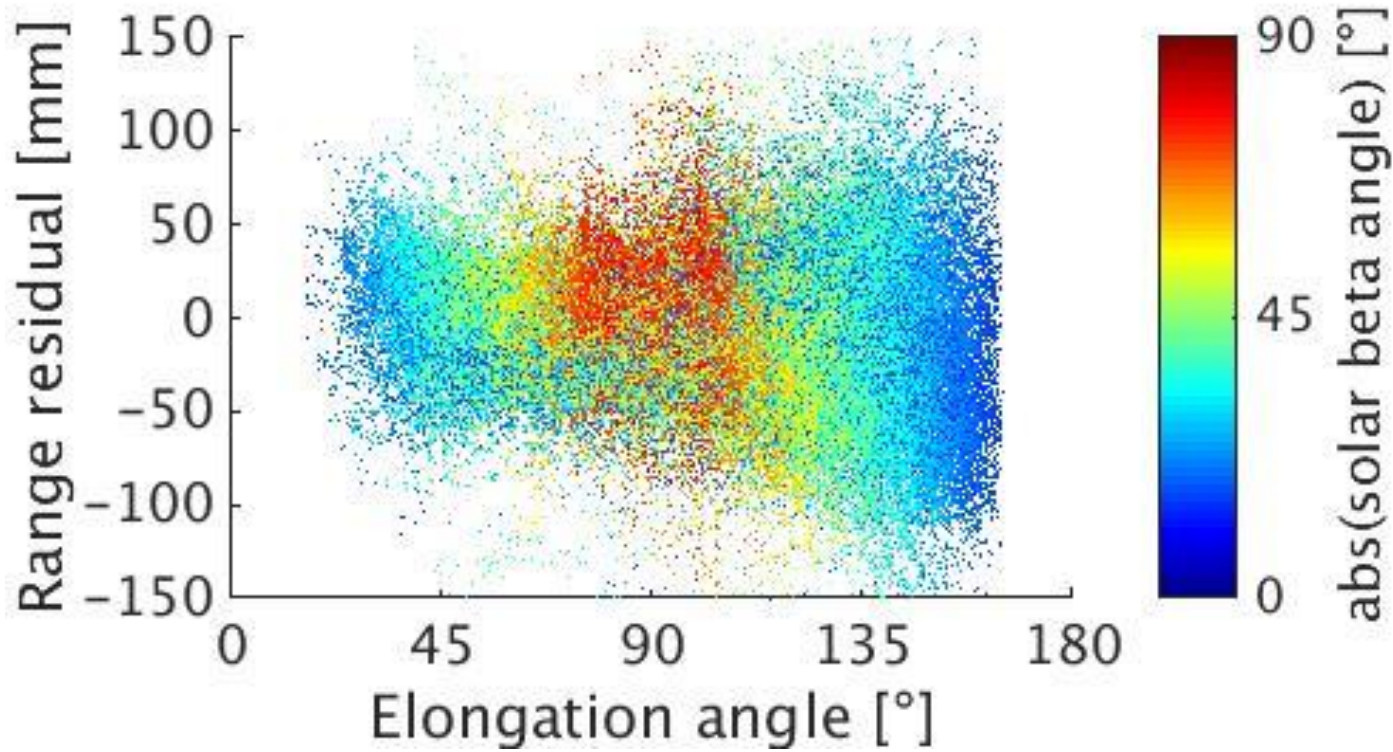
Validation of GNSS orbits (3)

- residuals w.r.t. GLONASS-M orbits (old ECOM)

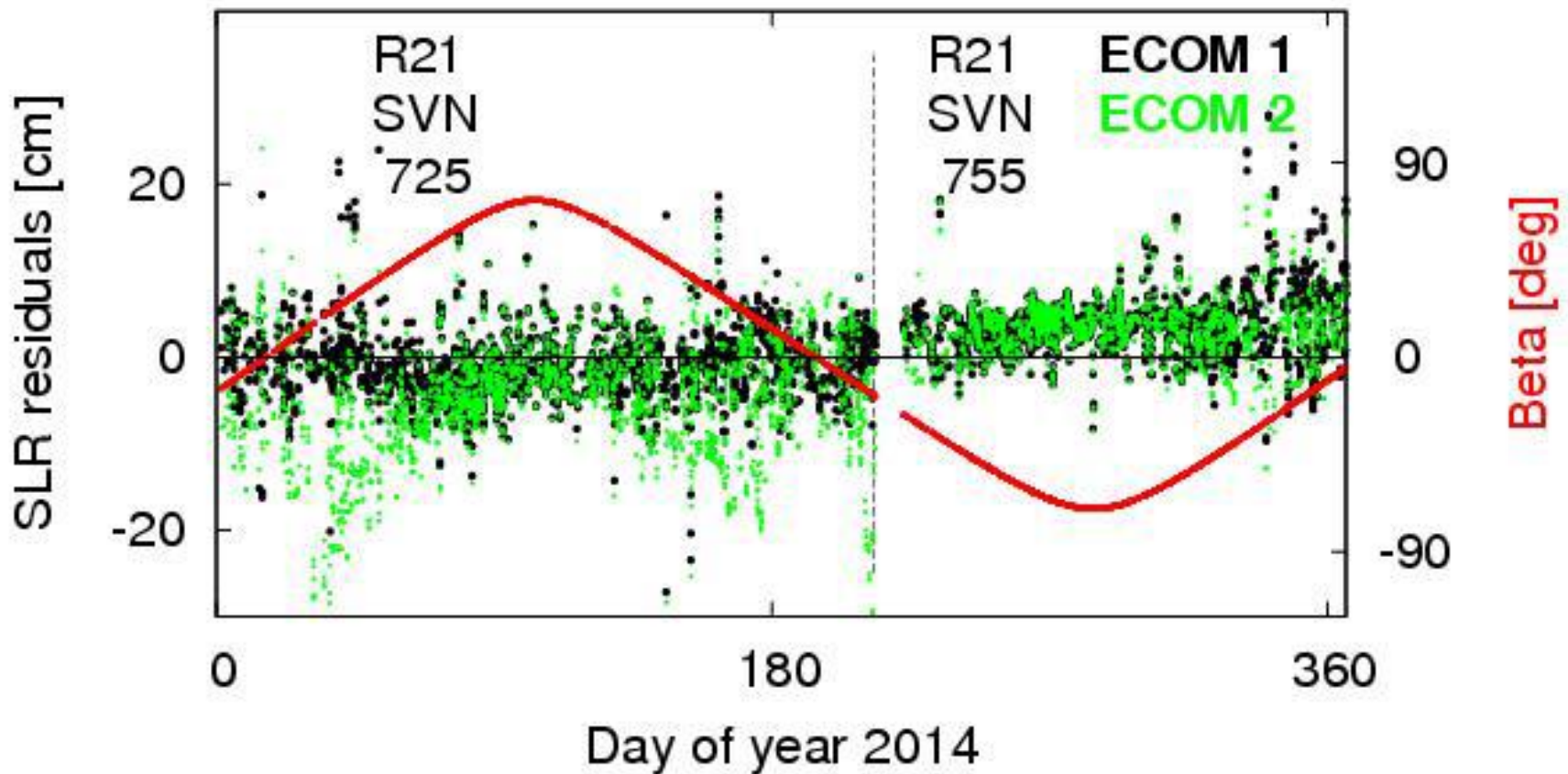


Validation of GNSS orbits (4)

- residuals w.r.t. GLONASS-M orbits (new ECOM)



Validation of GNSS orbits (5)



THANK YOU !