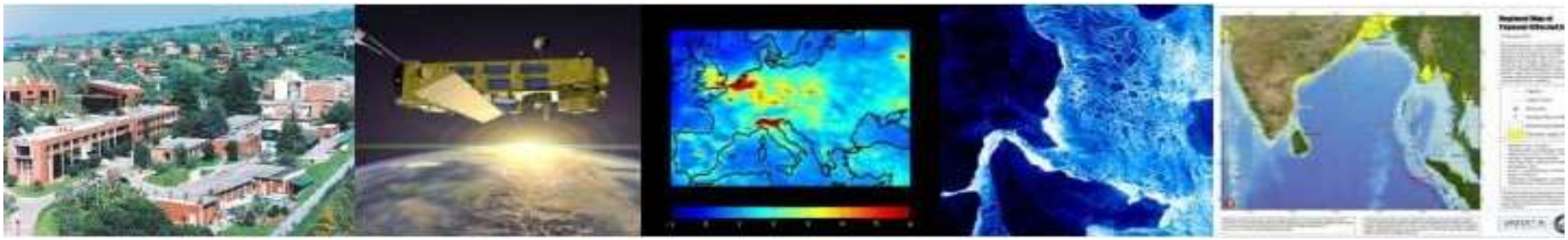
Overview of ESOC ITRF-2008 Processing



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Processing Standards

REFERENCE SYSTEM:

-polar motion and UT1: IERS bulletin A with IERS 2003 daily and sub-daily corrections

-stations coordinates: DPOD-2005 (v1.4) reference for Doris Stations, LPOD-2005 (v10) reference for SLR stations

-satellite reference: Post-Launch value of Mass, attitude model: Theoretical attitude model (yaw-steering)

FORCE MODELS:

-EIGEN-GRACE 05 gravity field up to degree/order 120 only C1 and S1 rates taken from IERS-2003 standards

- Atmospheric contribution to the gravity field up to degree/order 20 (AGRA 6-hourly files taken from GSFC service)
- IERS 2003 Solid Earth tides
- FES 2004 ocean tides (all principal constituents, with admittance) up to degree/order 50
- Sun, Moon, and all Planets (DE-405)
- ANGARA or plate model for drag, solar, infrared and albedo radiation
- MSIS-90 model for atmospheric density

Processing Standards

SATELLITE PARAMETERS:

- 1-Day arcs, estimated Satellite State Vector
- Ten drag coefficients and one 1/rev along-track and cross-track constant per 24 hours for SPOT-X and Envisat.
- Four drag coefficients and one 1/rev along-track and cross-track constant per 24 hours for T/P and Jason-1/2
- Manoeuvres only for Envisat estimated other satellites excluded from the daily solution

TRACKING DATA:

- All station displaced corrections according to IERS 2003
- No atmospheric loading applied
- DORIS:
- Troposphere: dry zenith calculated using GPT with Saastamoinen mapped with Dry GMF mapping function. Wet zenith delay estimated and mapped with wet GMF mapping function
- Frequency: Bias per pass adjusted
- Weight: 0.5 mm/s, 10 degrees elevation cut-off for all satellites, no down weighting applied to data

Processing Standards

ESTIMATED ITRF PARAMETERS:

One day normal equation solutions are generated free of any constrains that include all the estimated parameters including the following ITRF parameters:

- Station coordinates
- One set of EOP values (offsets and rates)
- LOD

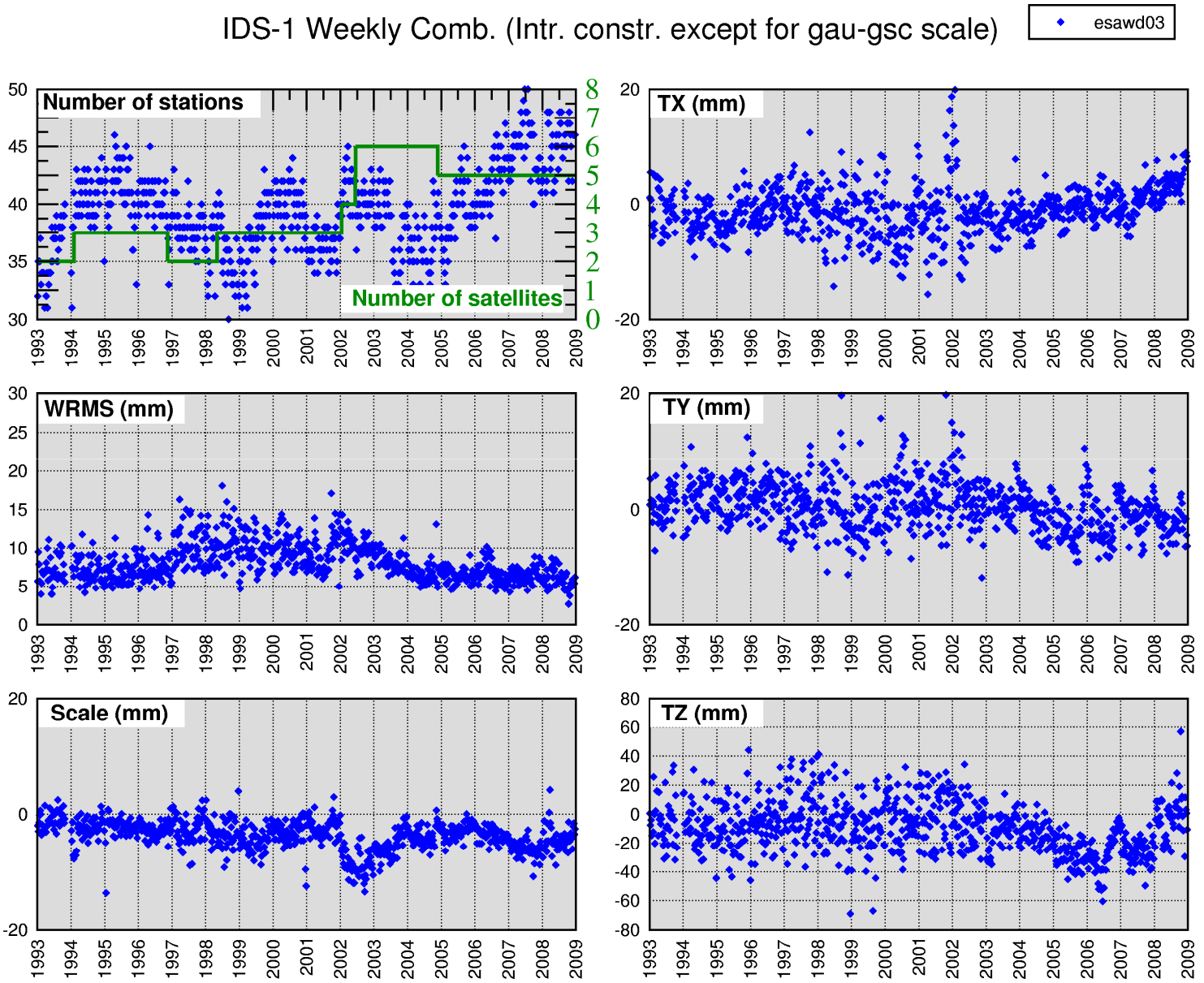
WEEKLY SINEX GENERATION:

• 7-Daily Solutions are stacked together on the normal equation level. From each daily solution the none ITRF parameters are rigorously eliminated (for the satellite drag and CPR parameters constrains are applied when eliminating them).

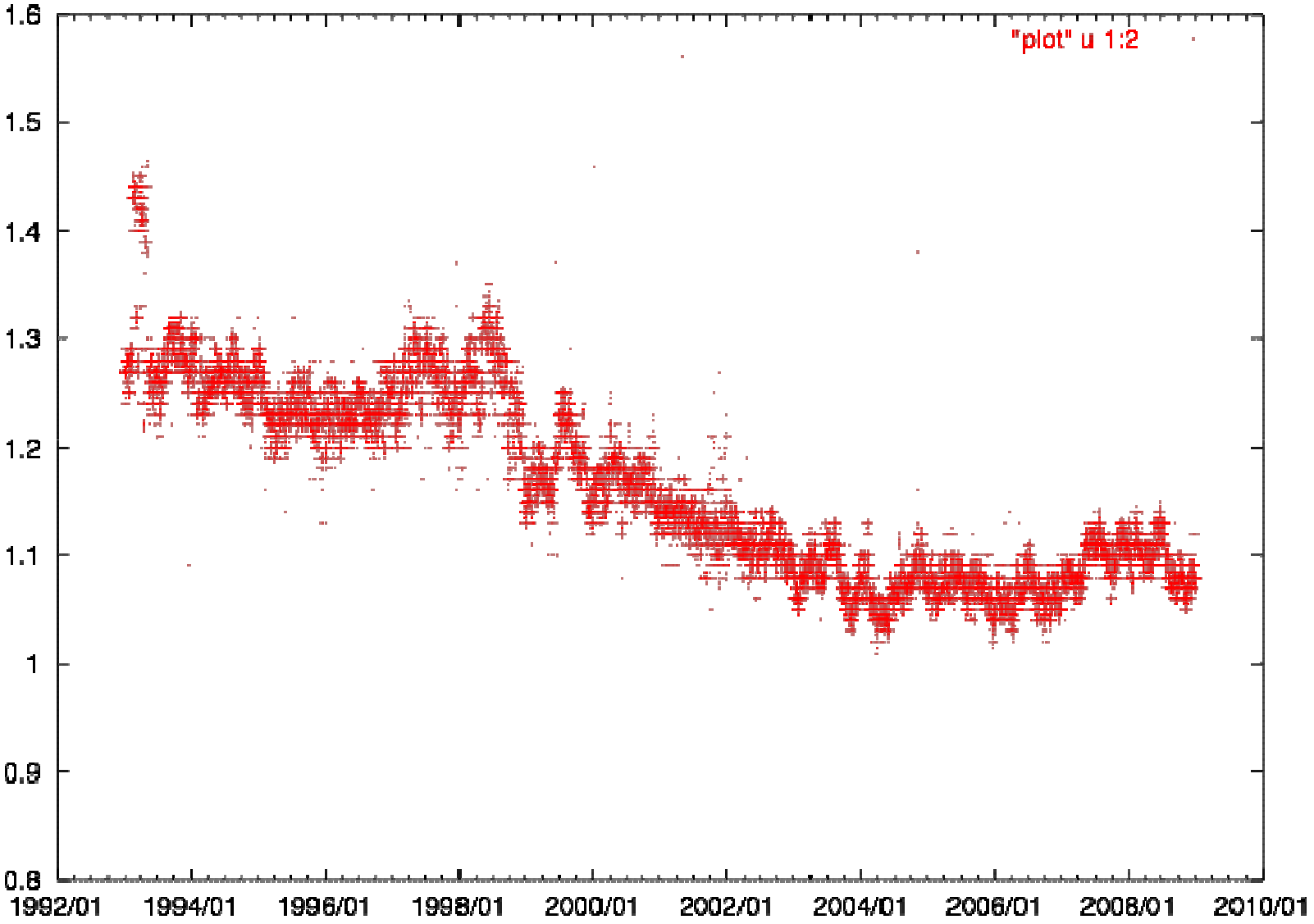
• The resulting SINEX file contains thus the ITRF parameters free of any constrain.

• The daily normal equation files are saved and different elimination strategies can be used without having to regenerate the daily solutions.

Results

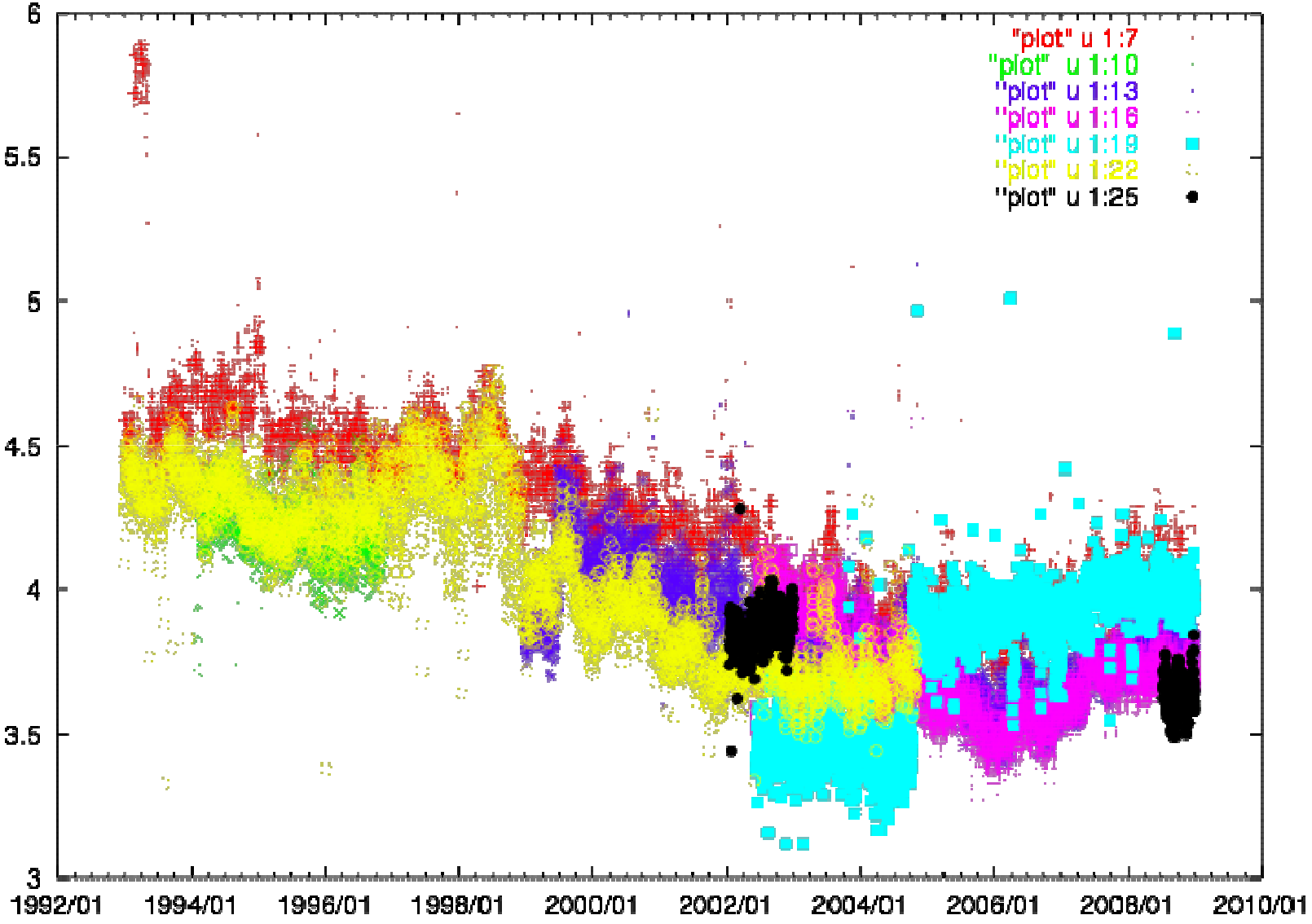

IDS-1 Weekly Comb. (Intr. constr. except for gau-gsc scale)
esawd03
Number of stations
Number of satellites
TX (mm)
WRMS (mm)
TY (mm)
Scale (mm)
TZ (mm)

WRMS of Daily Solutions

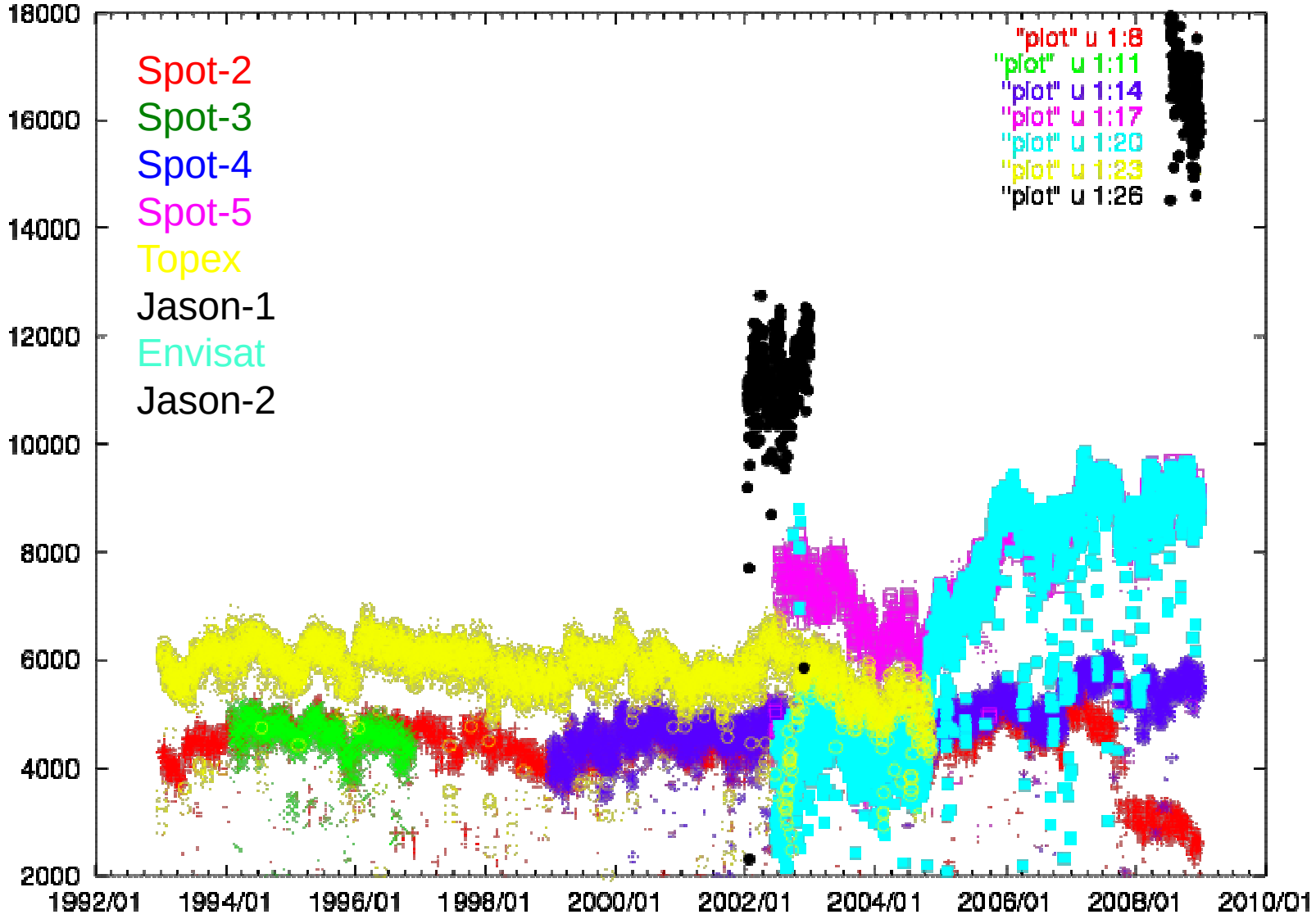


Daily residual for each Satellite

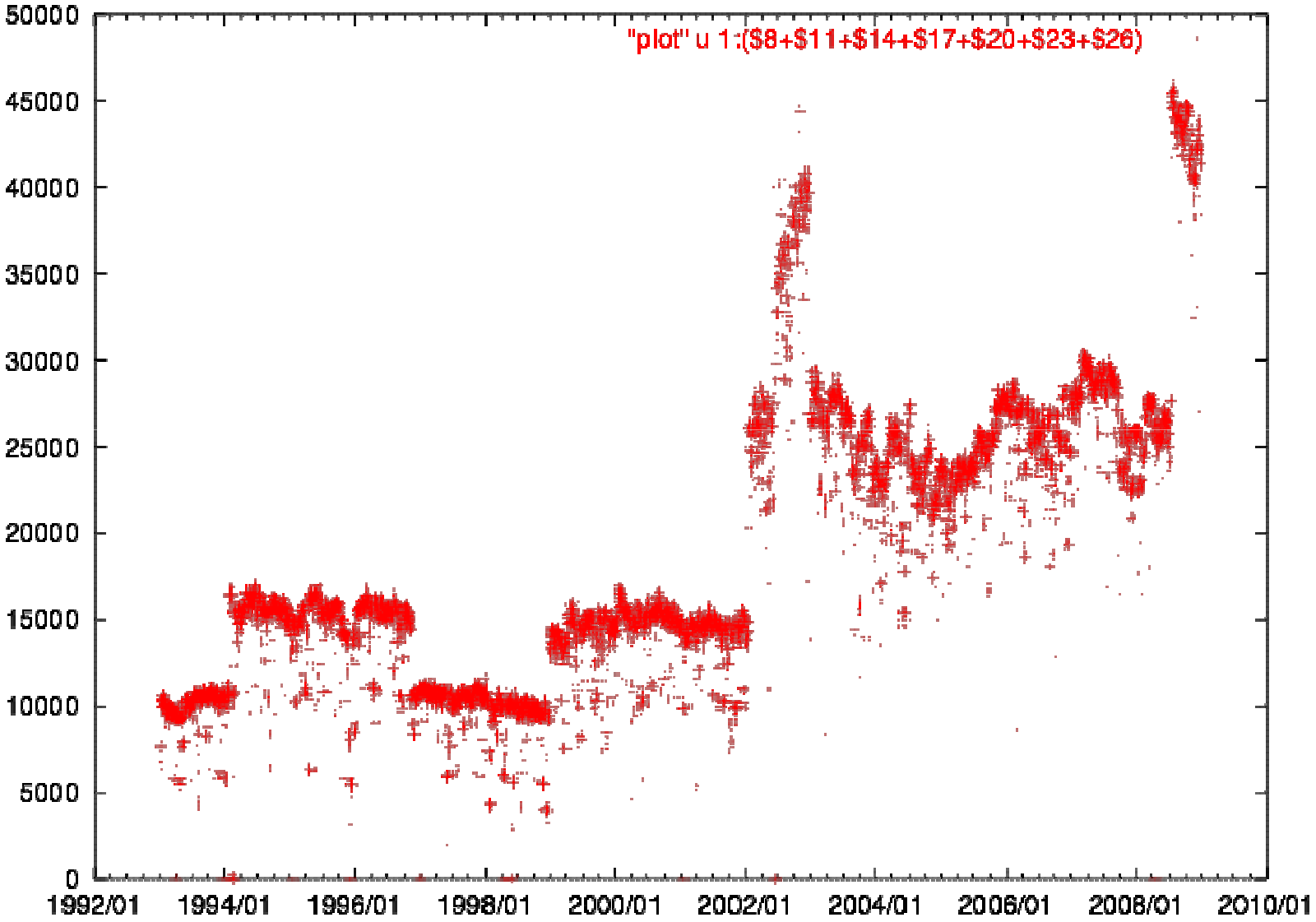
Spot-2
Spot-3
Spot-4
Spot-5
Topex
Jason-1
Envisat
Jason-2



Number of daily Observations



Total Number of Daily Observations



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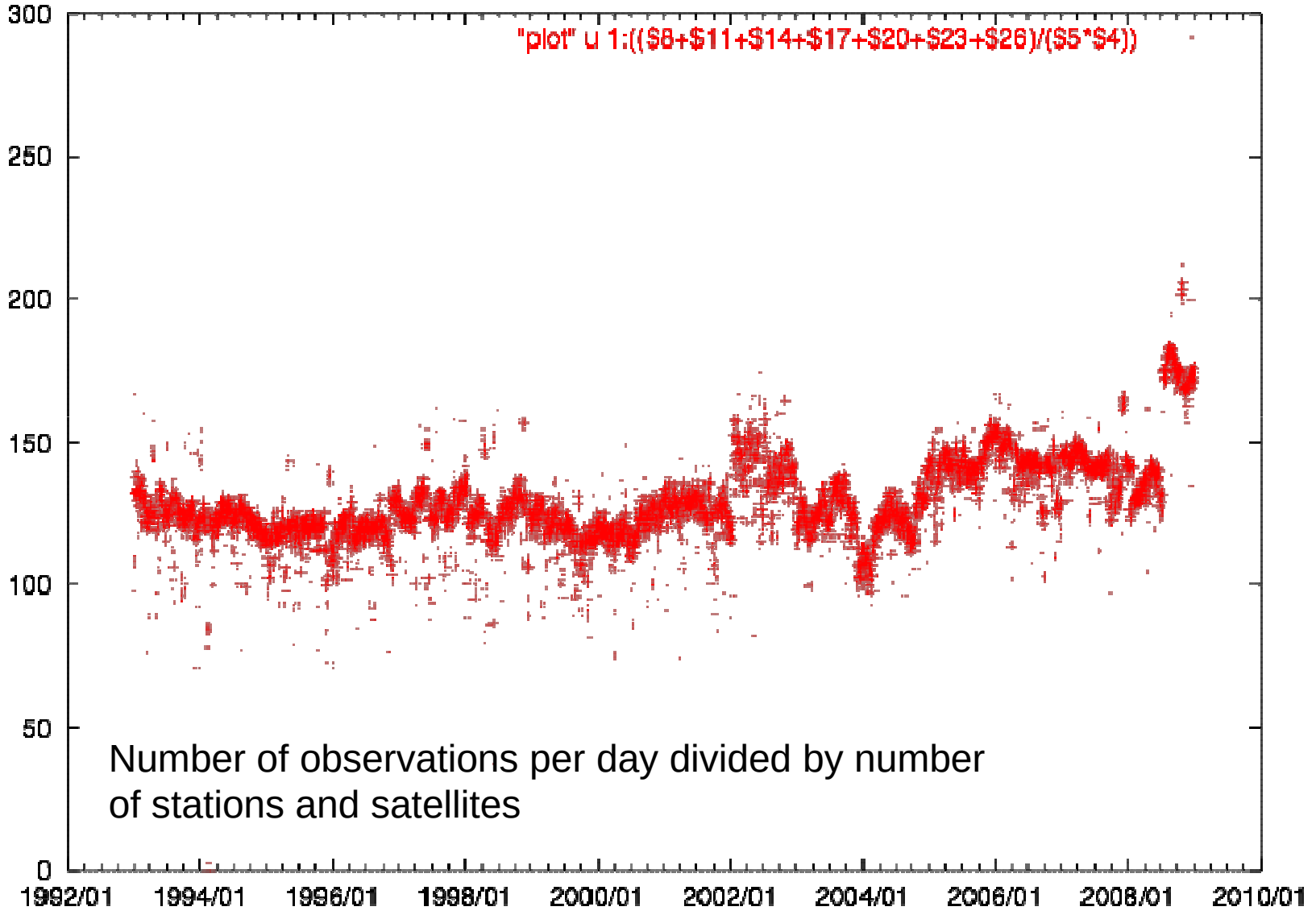
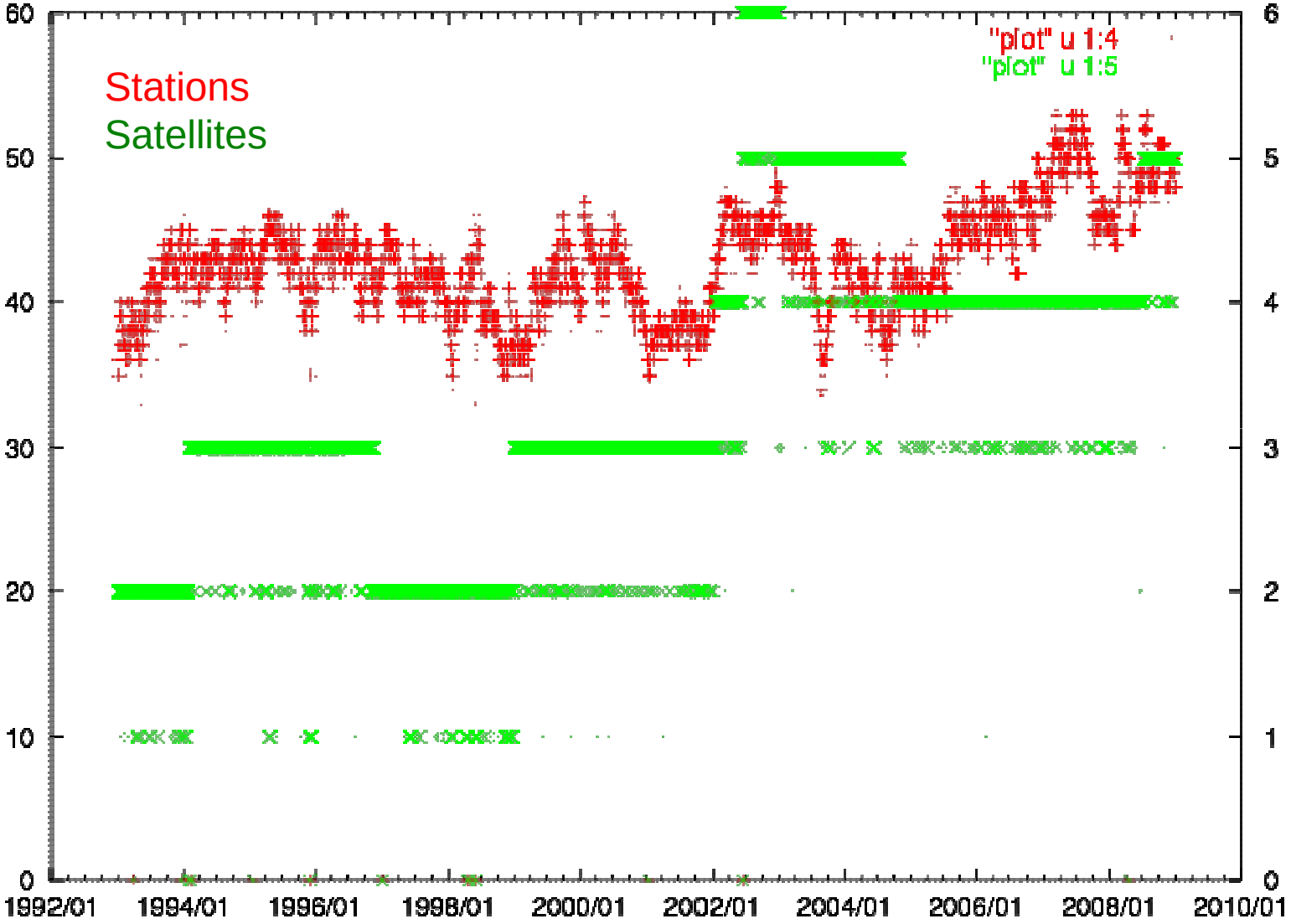
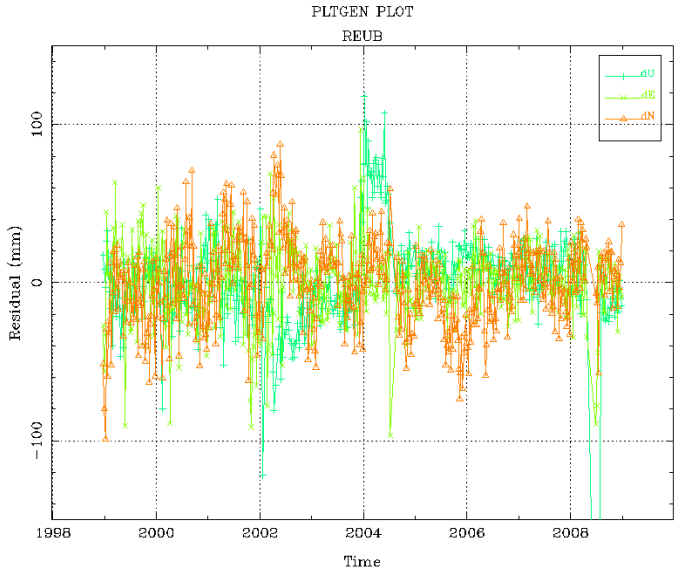


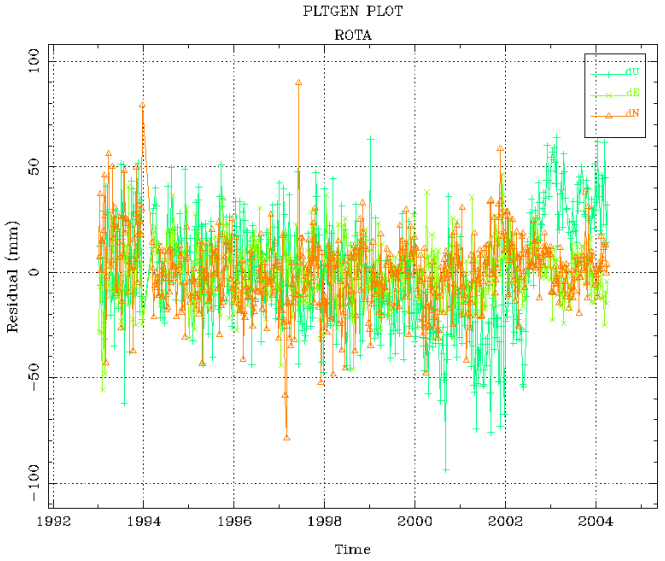
Number of observations per day divided by number of stations and satellites

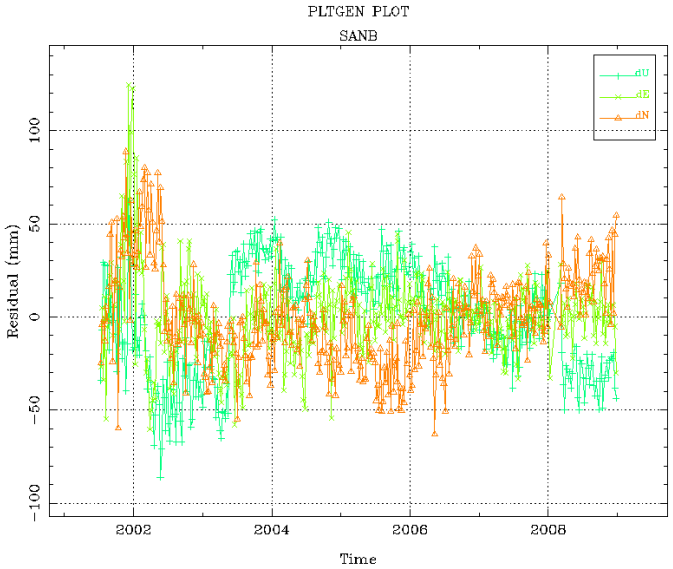
Number stations and satellites

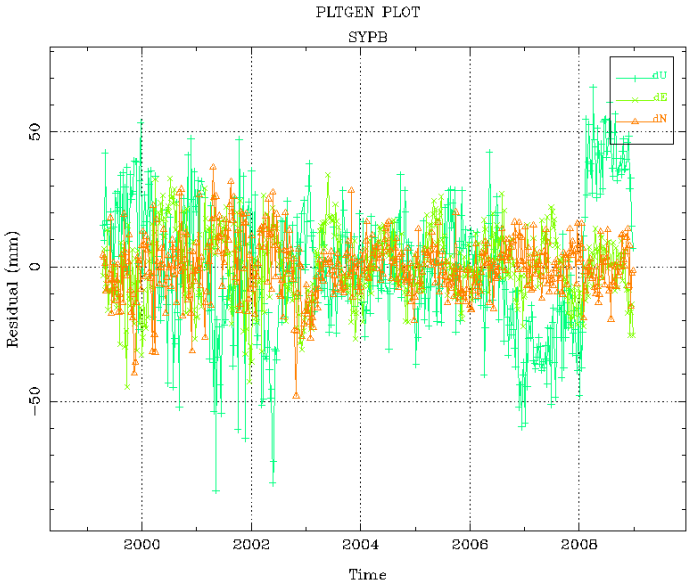
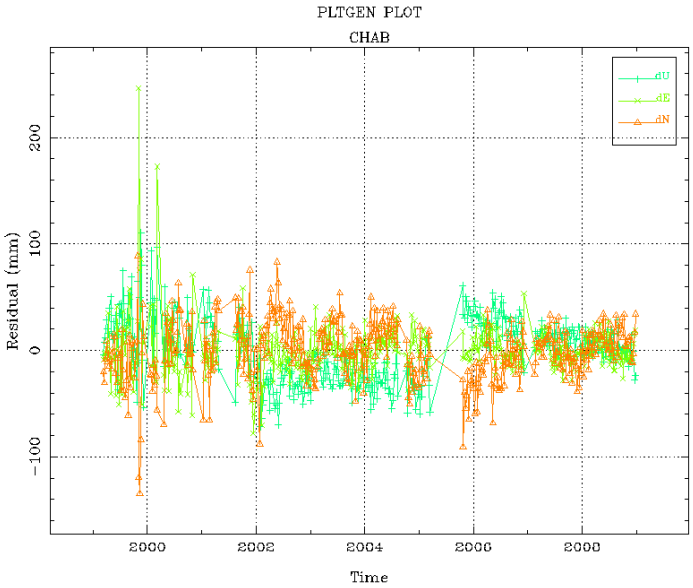
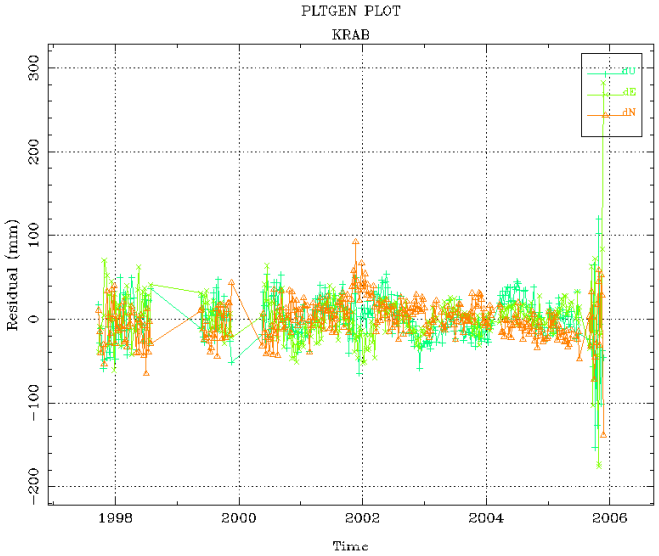
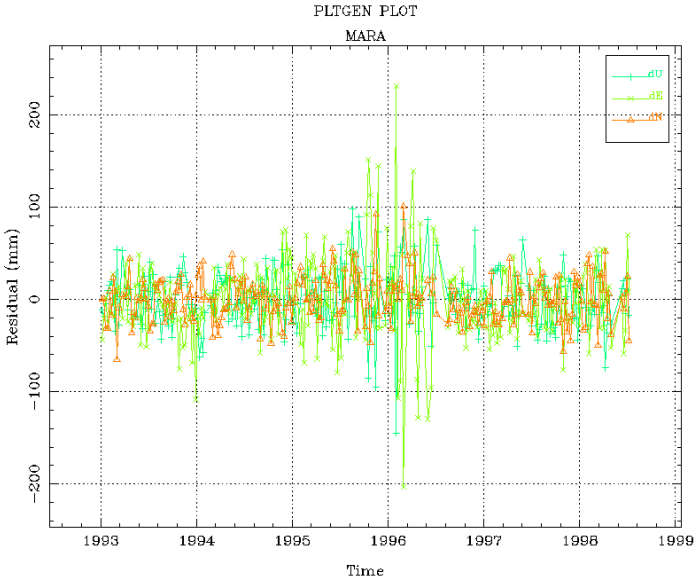
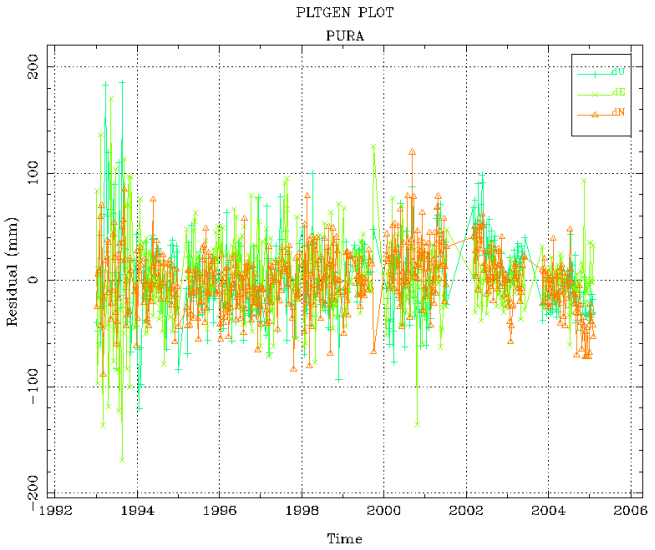


Stations with Jumps









Stations with noisy periods