

# Availability of SLR Normal Points at ILRS Data Centers

17th International Workshop  
on Laser Ranging  
Bad Kötzing, Germany, May 16 - 20, 2011

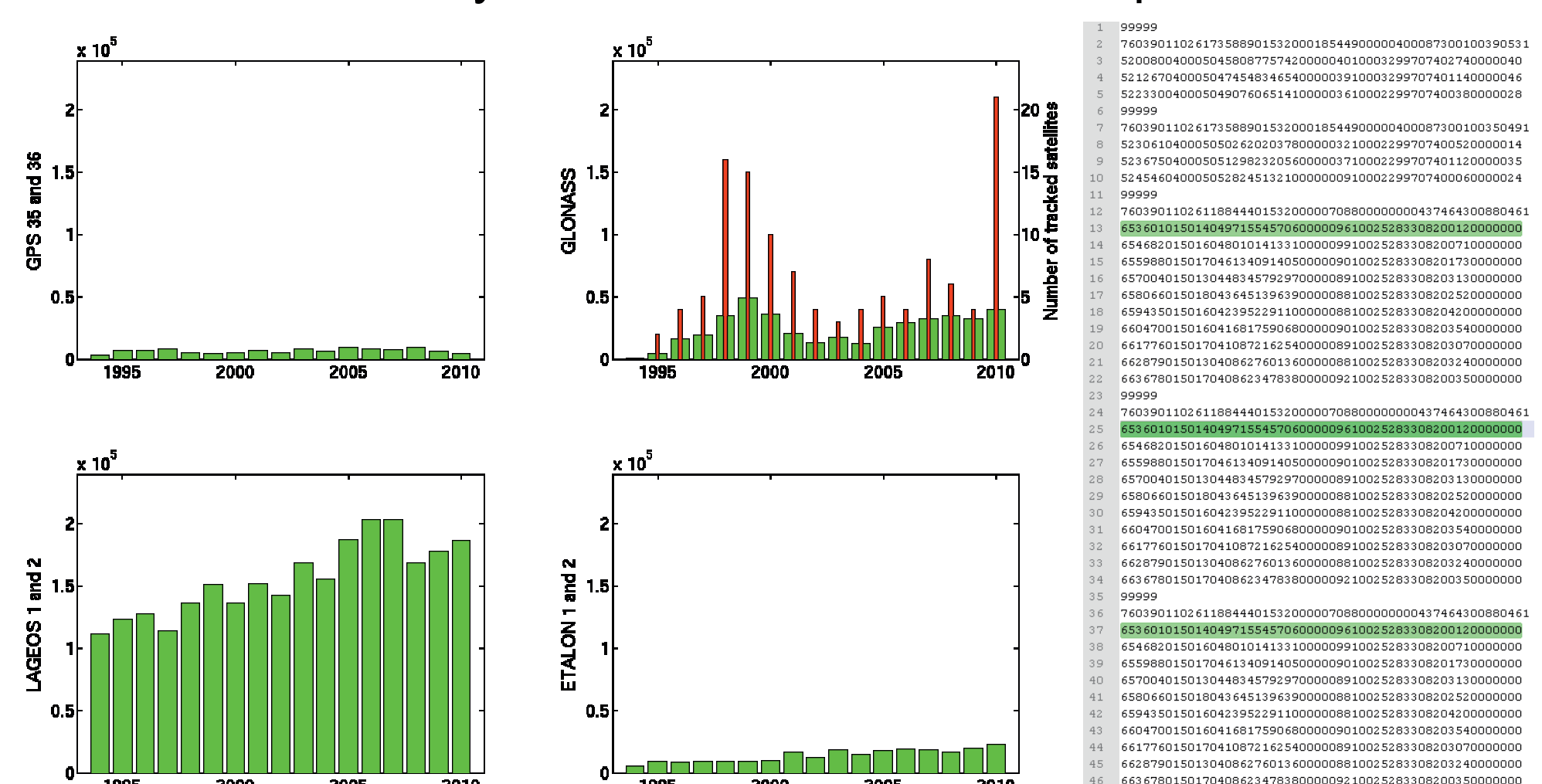
Krzysztof Sośnica, Daniela Thaller, Rolf Dach, Adrian Jäggi, and Gerhard Beutler  
Astronomical Institute, University of Bern (AIUB), Switzerland

## Data management

SLR observations in normal point format are available from two ILRS global data centers, namely CDDIS and EDC. The data are organized in daily and monthly files. The centers have different management philosophies. In CDDIS the data is released within one day, whereas EDC publishes data in daily and monthly batches, containing observations stemming exactly from one particular day or month, respectively. After station upgrades, laser or telescope repairs, data from those stations are sent into "quarantine", which may last for half a year or even longer. CDDIS publishes SLR observations from several previous months in one file (labelled with the release date), whereas EDC publishes the observations attached to the files labelled with the date of the measurement.

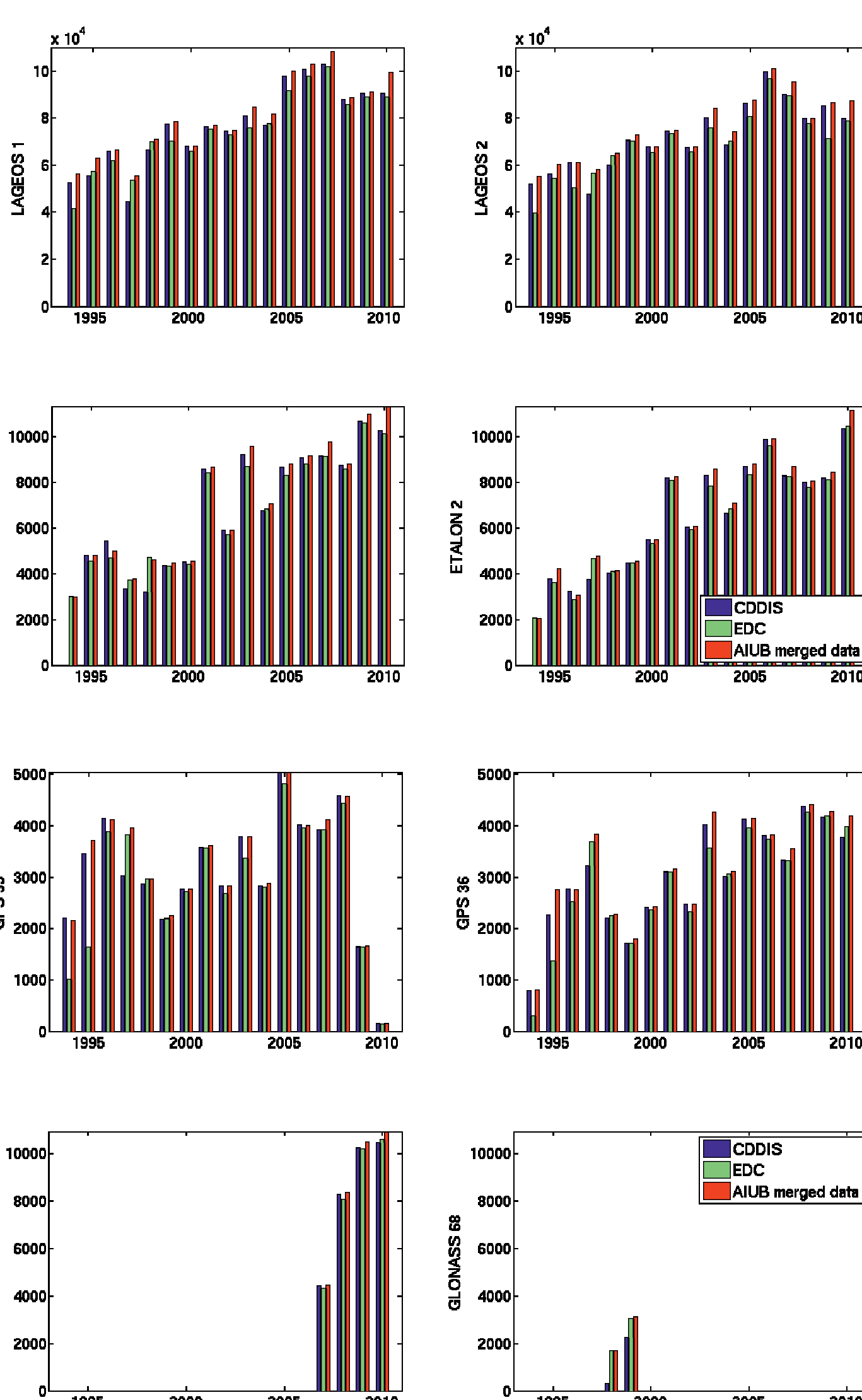
Complications may occur with the second and third release of data (for instance after reducing the station's time bias): the same observations are available twice, three or even more times in CDDIS files (with increased data release flag in the data record of the normal point). One has to pay special attention in order not to use bad data but to use only the latest release.

The above mentioned aspects must be considered in particular when reprocessing SLR data, because all observations should be considered correctly in order to achieve the best possible results.



**Fig. 1a:** Number of observations to GPS -35, -36, GLONASS, LAGEOS -1, -2 and ETALON -1, -2 in the period 1994-2010.

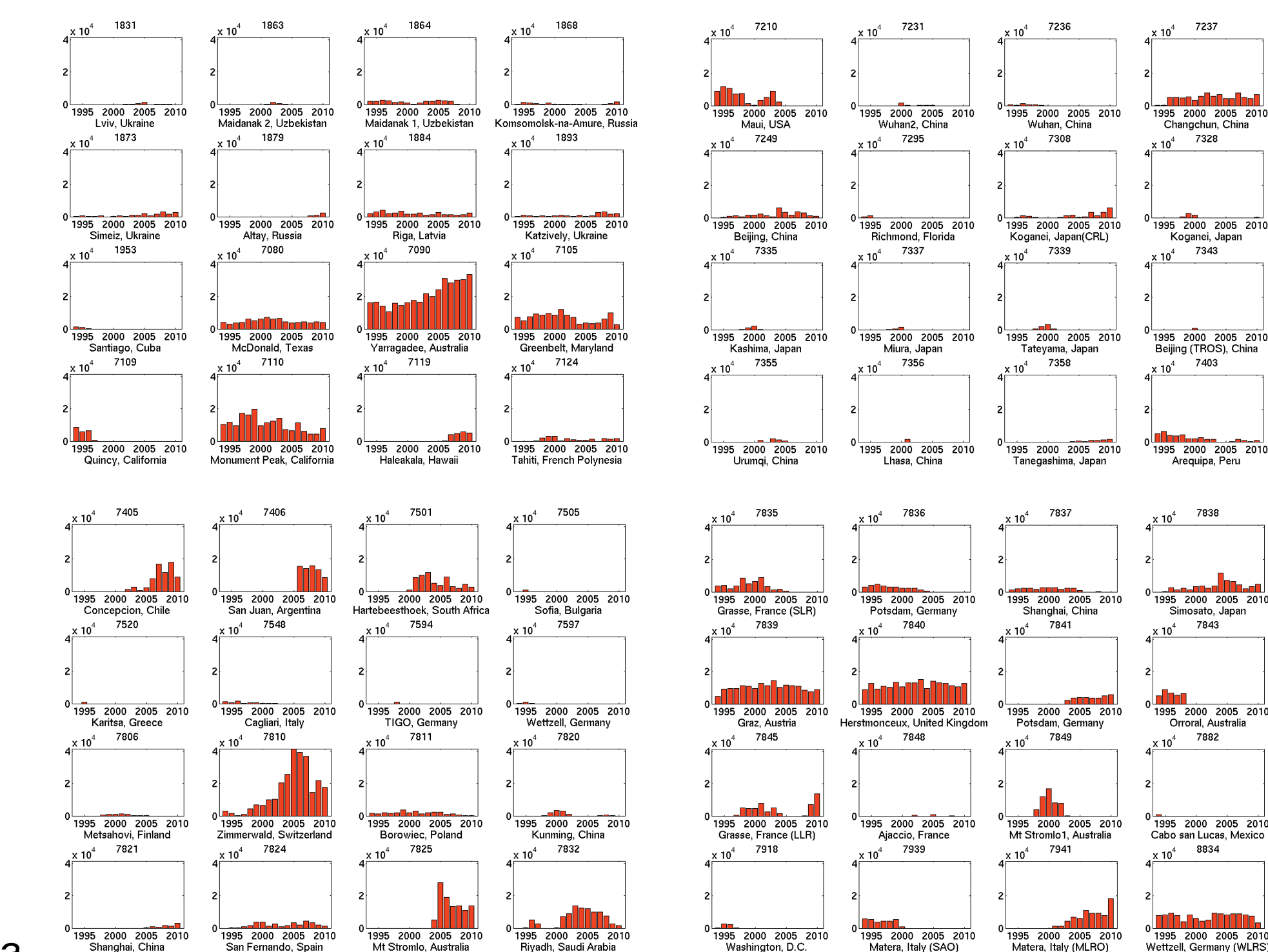
**Fig. 1b:** Multiple entries for the same observation in CDDIS data center (in <http://cddis.gsfc.nasa.gov/pub/slr/data/npt/lageos1/2010/lageos1.100919>).



**Fig. 2:** Number of available normal points in both ILRS data centers and in the AIUB datapool (status: February 2011).

## Missing and multiple data

Problems with "Quick Look" files were also identified e.g. the files contain multiple entries for the same data (see Fig. 1b). The differences between management of the datapools generate inconsistencies of the datapools in both ILRS centers. Reprocessing of the SLR data calls for special handling of all available observations. For this purpose we use at AIUB merged data from both data centers: CDDIS and EDC (see Fig. 2).



**Fig. 3:** Number of LAGEOS -1, -2 and ETALON -1, -2 normal points for the best performing SLR stations in 1994-2010.

## Conclusions

- The ILRS data centers differ in the number of available observations due to different management philosophies,
- Some observations are missing in EDC or CDDIS,
- There are multiple entries for normal points in CDDIS,
- There are big differences in the quantity and quality of SLR data stemming from different stations (see Fig. 3, Fig. 4).

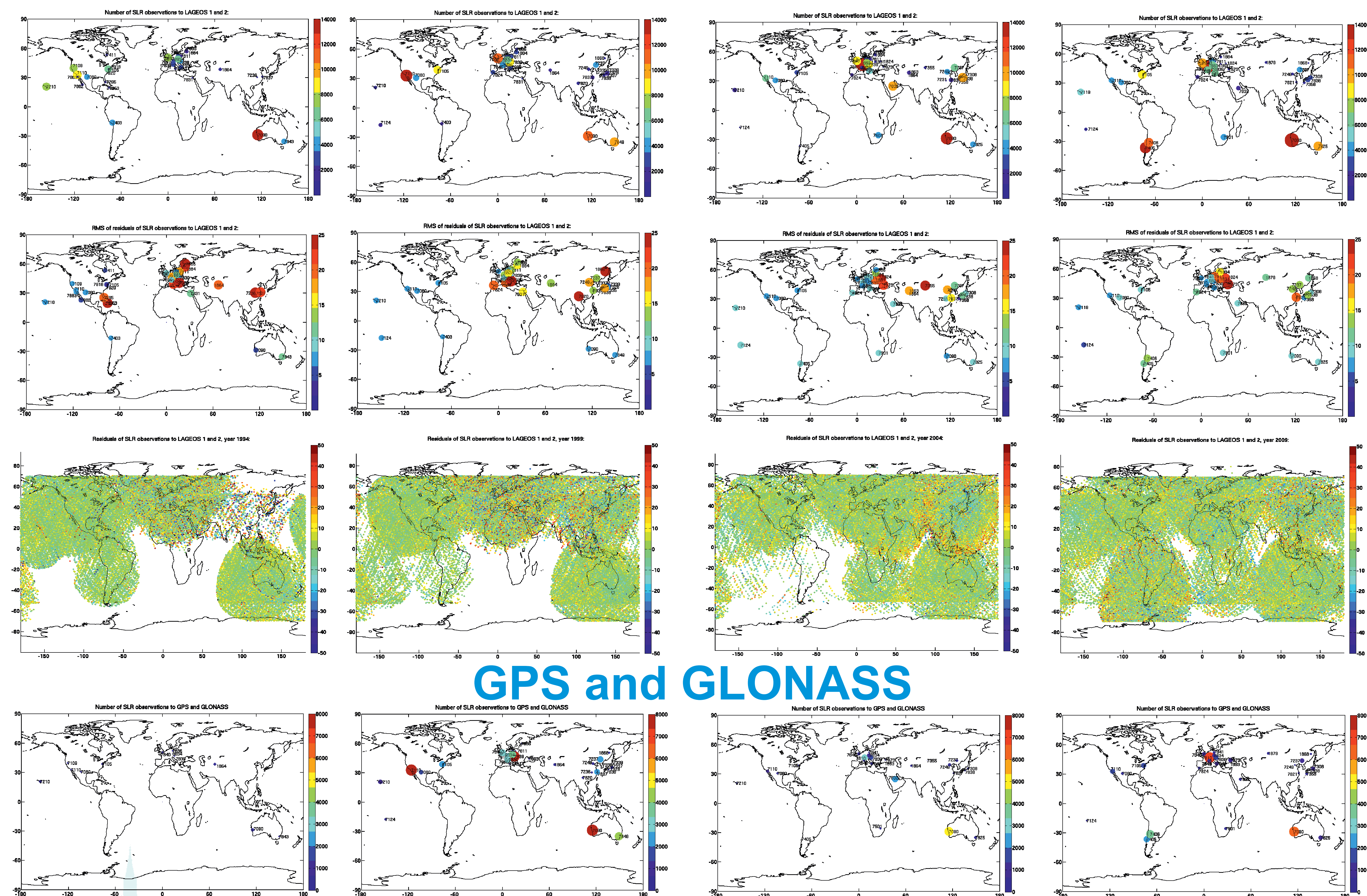
1994

1999

2004

2009

LAGEOS -1 and -2



## GPS and GLONASS

**Fig. 4:** Data statistics. First line: Number of observations to LAGEOS -1, -2 (after screening). Second line: RMS of residuals to LAGEOS -1, -2 in mm. Third line: Groundtracks of observation residuals in mm for LAGEOS -1, -2. Forth line: Number of observations to GPS -35, -36 and all GLONASS satellites.