



Space Research Centre

Polish Academy of Sciences

Borowiec Astrogeodynamic Observatory

14th International Laser Ranging Workshop

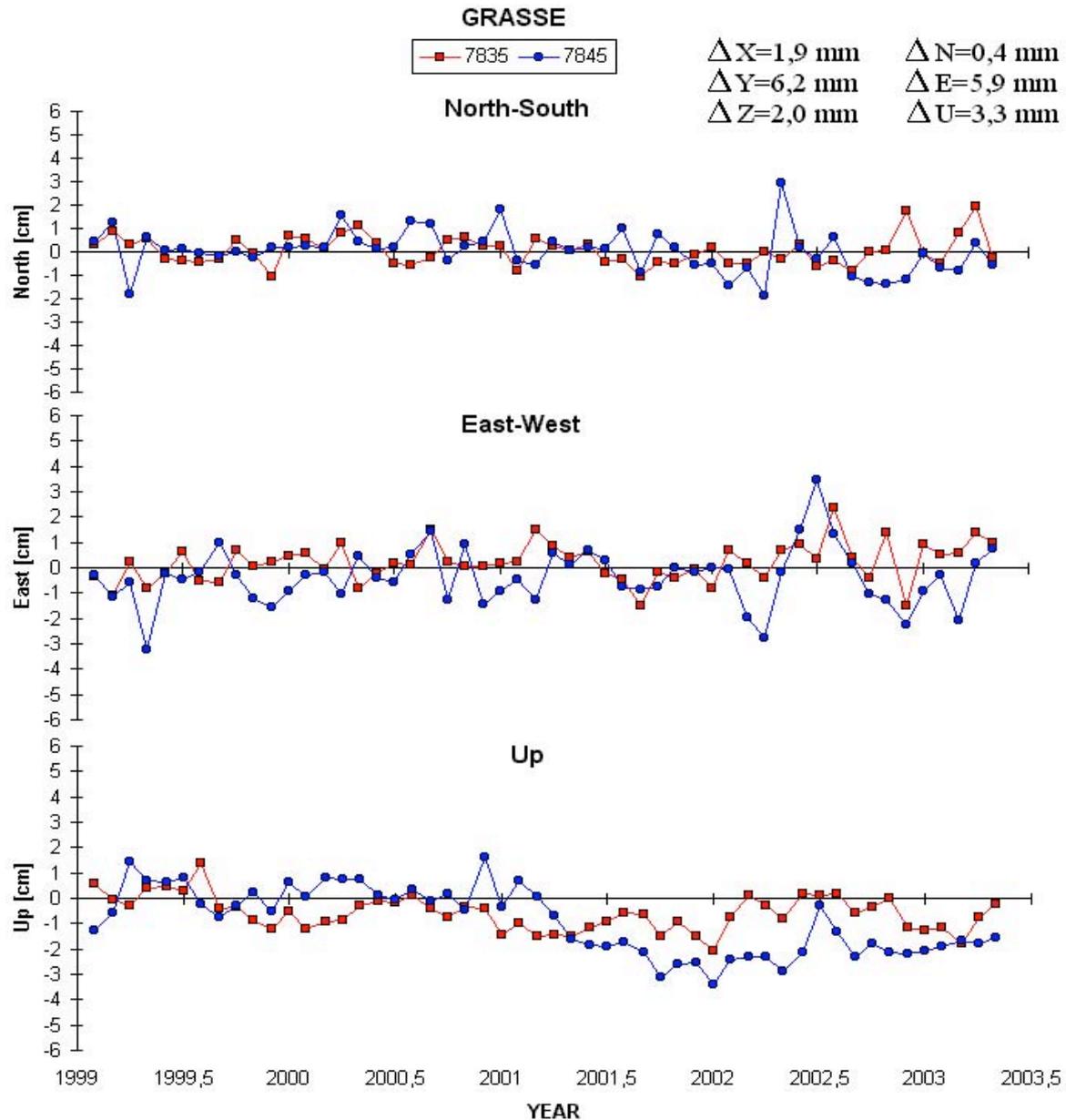
San Fernando, 07-11 June 2004

**DETERMINATION OF THE STATION COORDINATES FOR
QUALITY CONTROL OF THE SATELLITE LASER RANGING DATA**

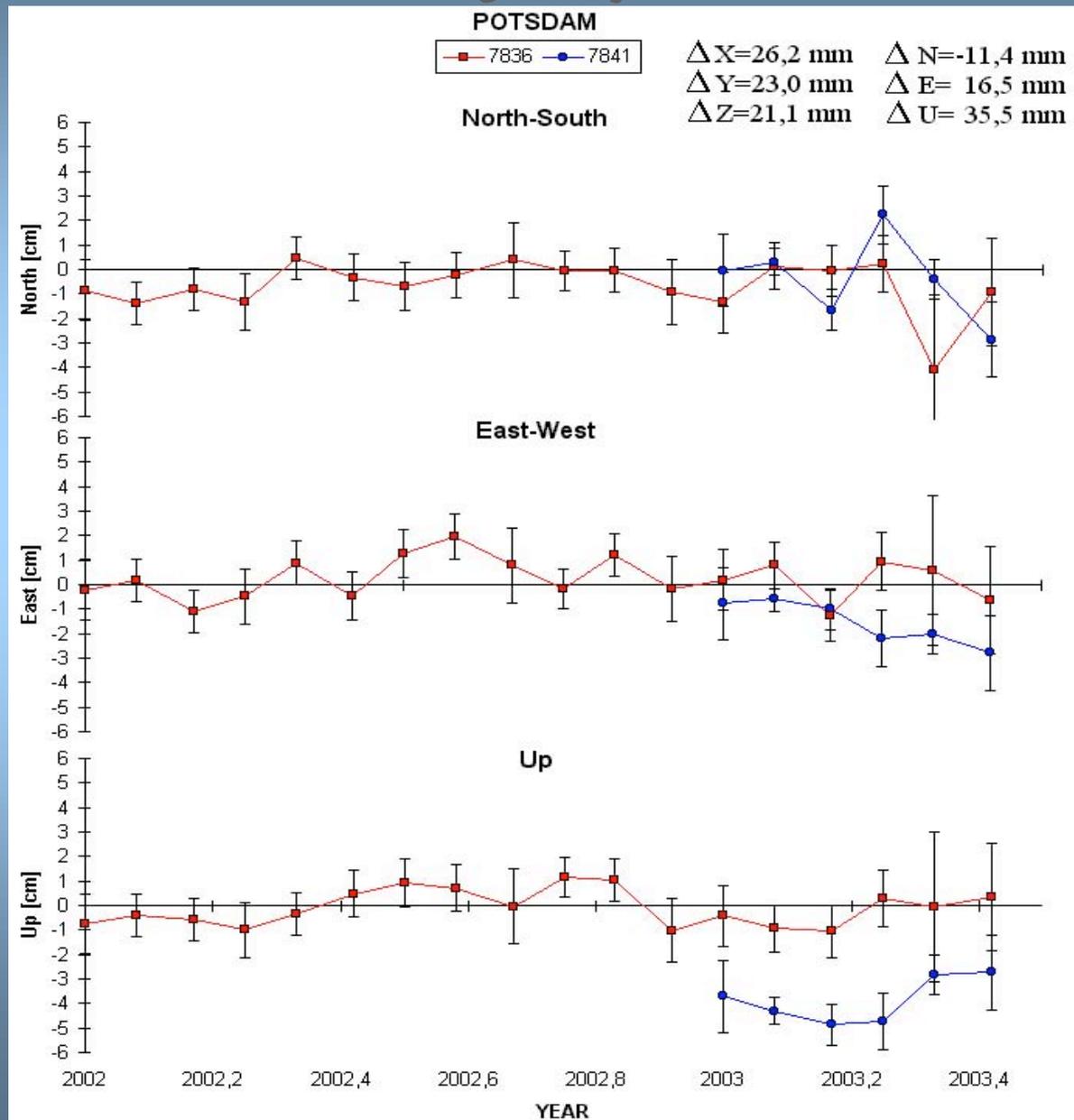
Stanislaw Schillak

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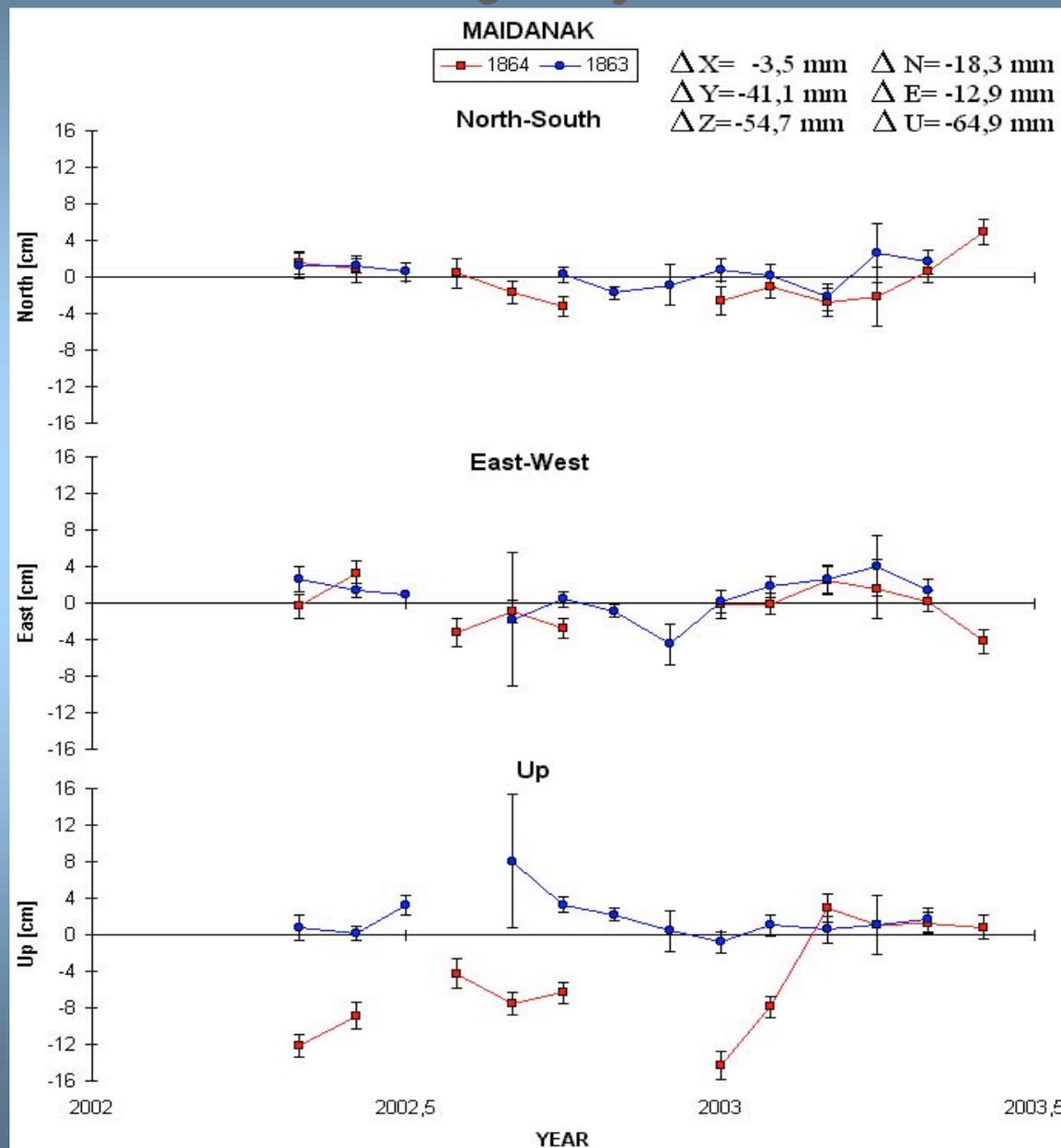
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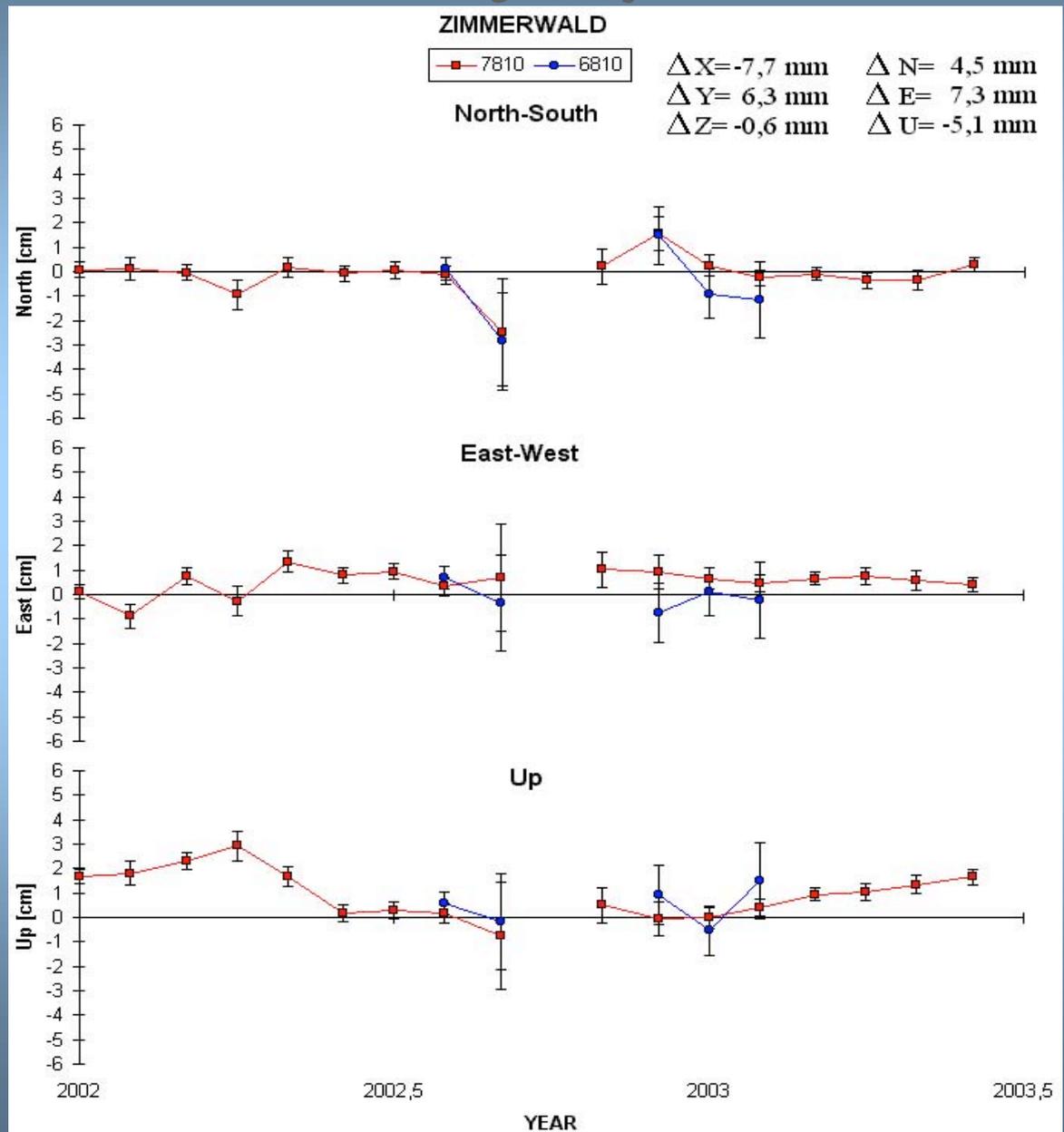
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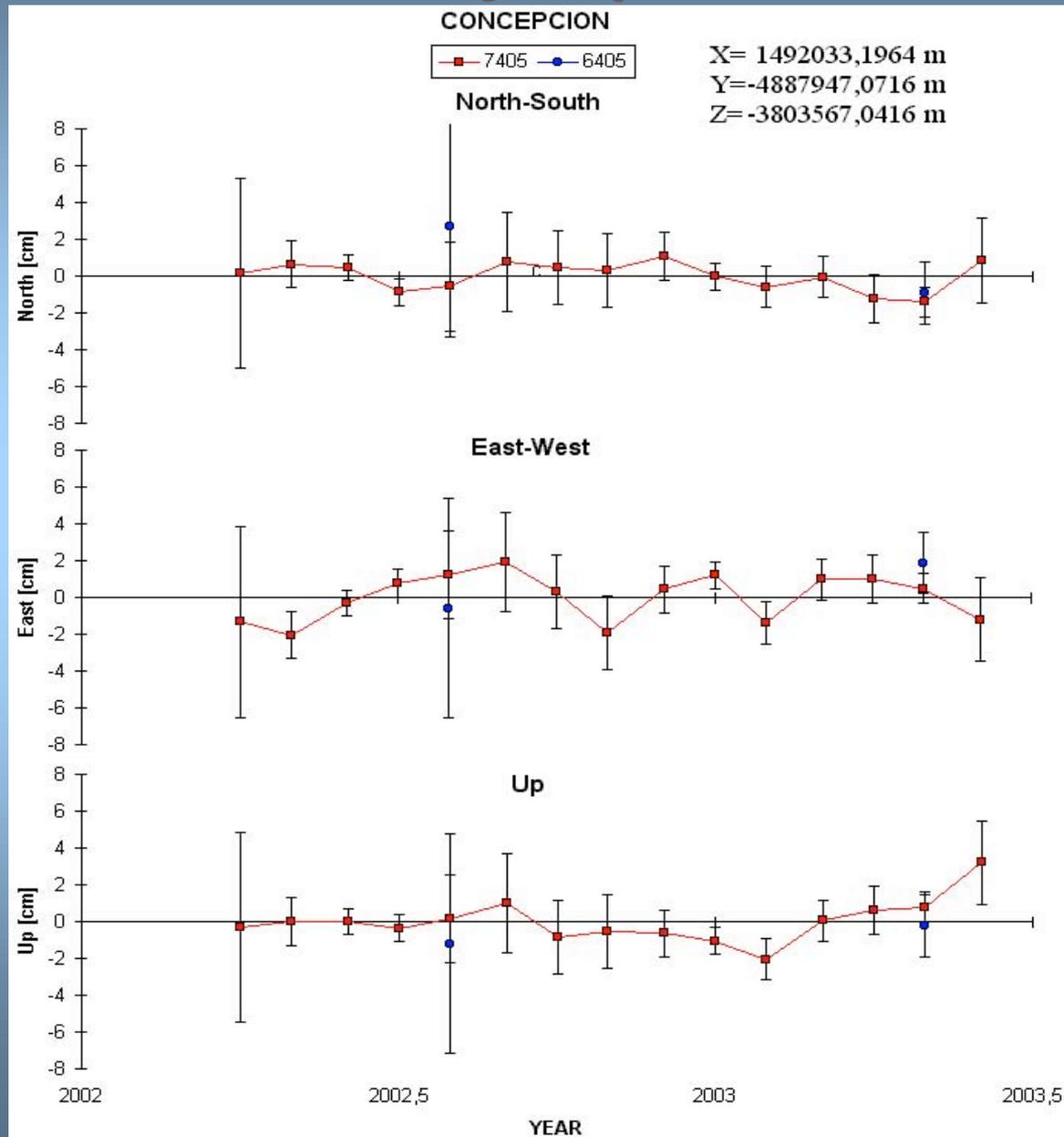
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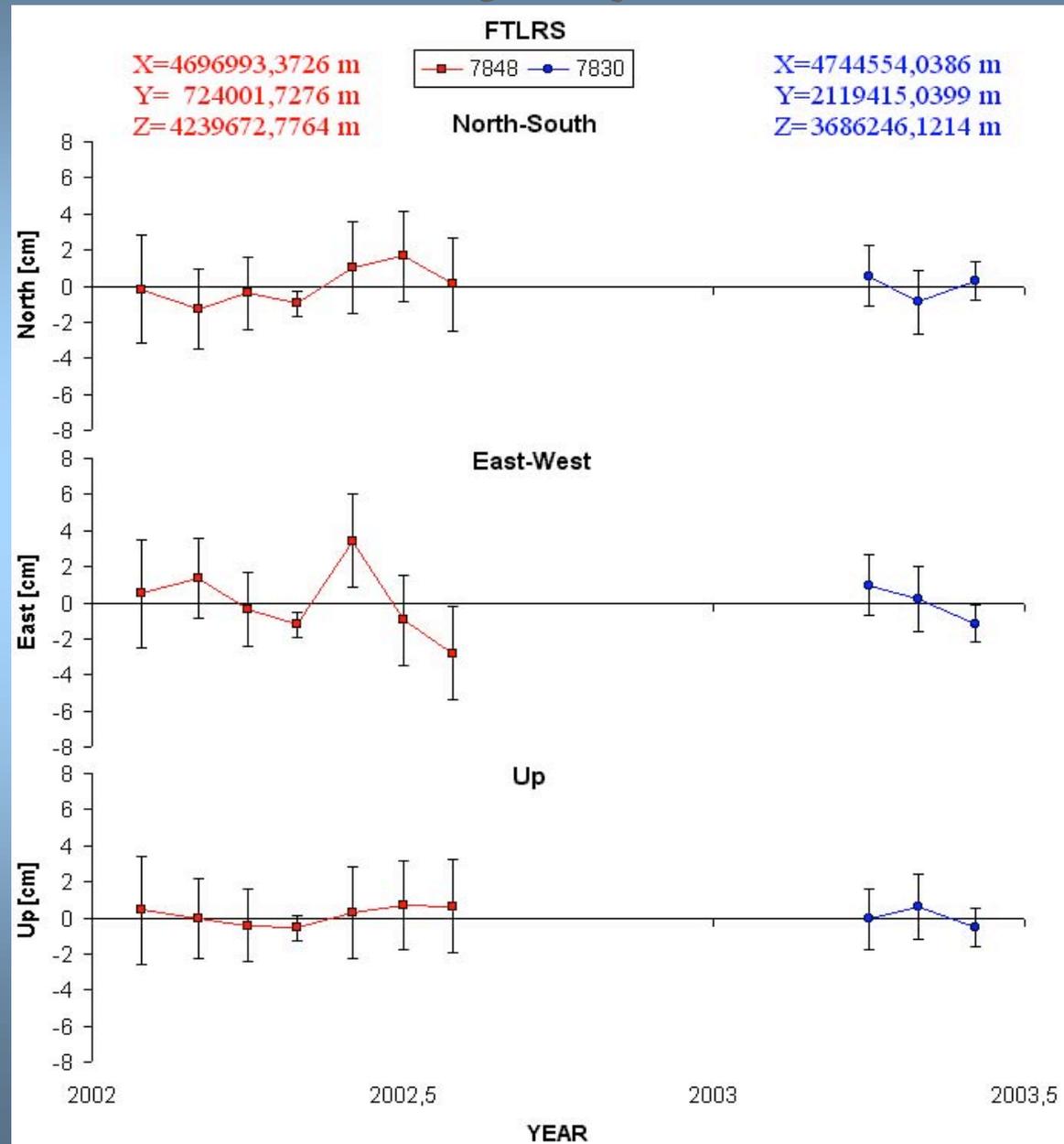
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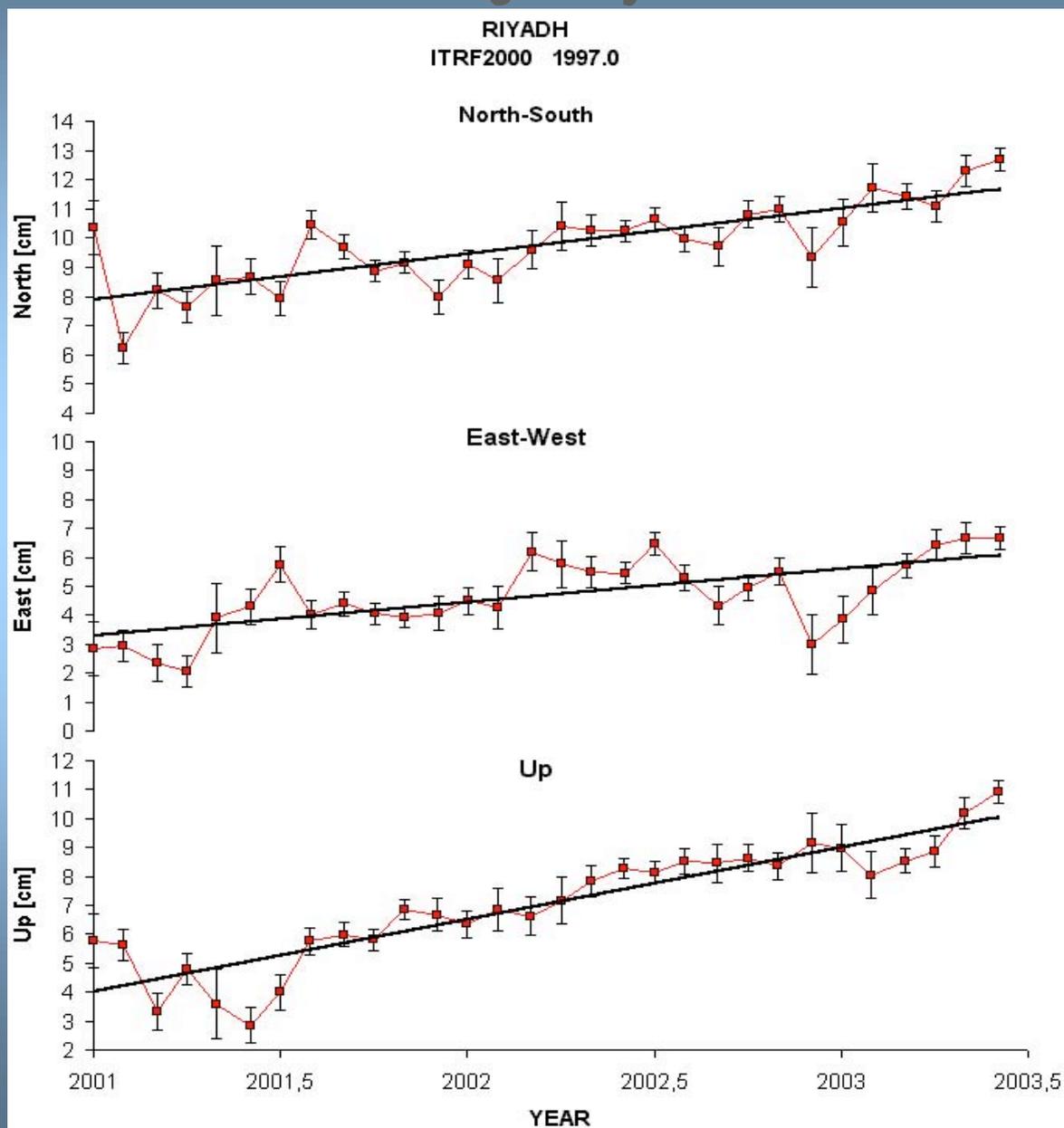
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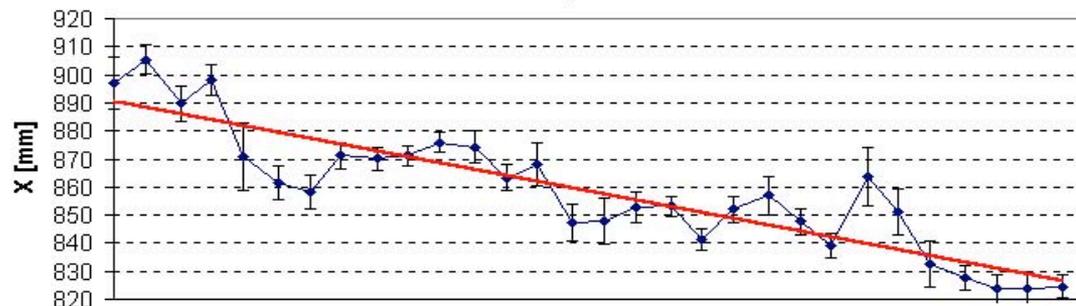
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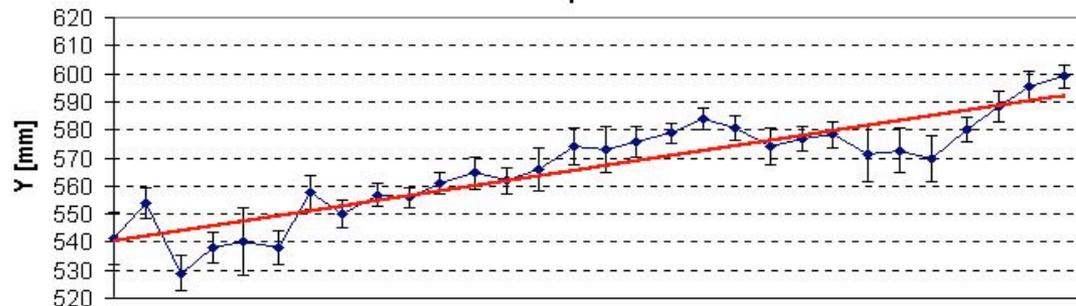
Arabian Tectonic Plate Motion

Riyadh

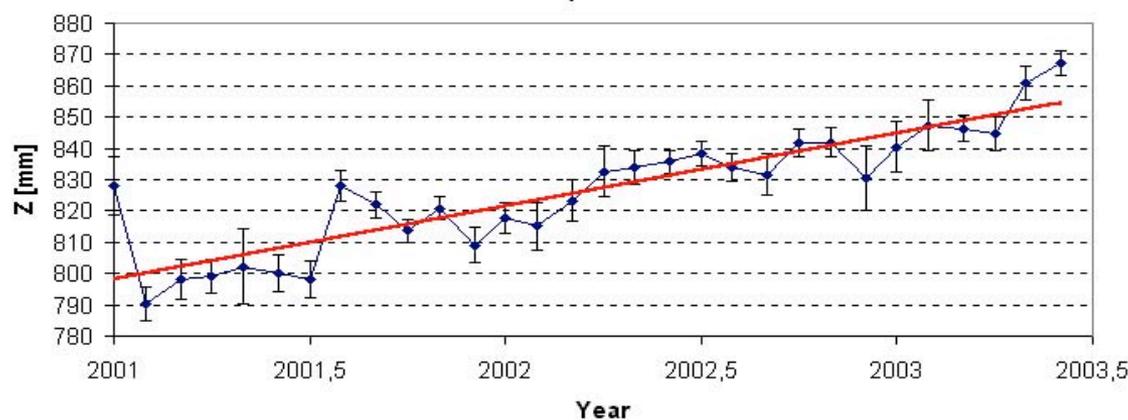
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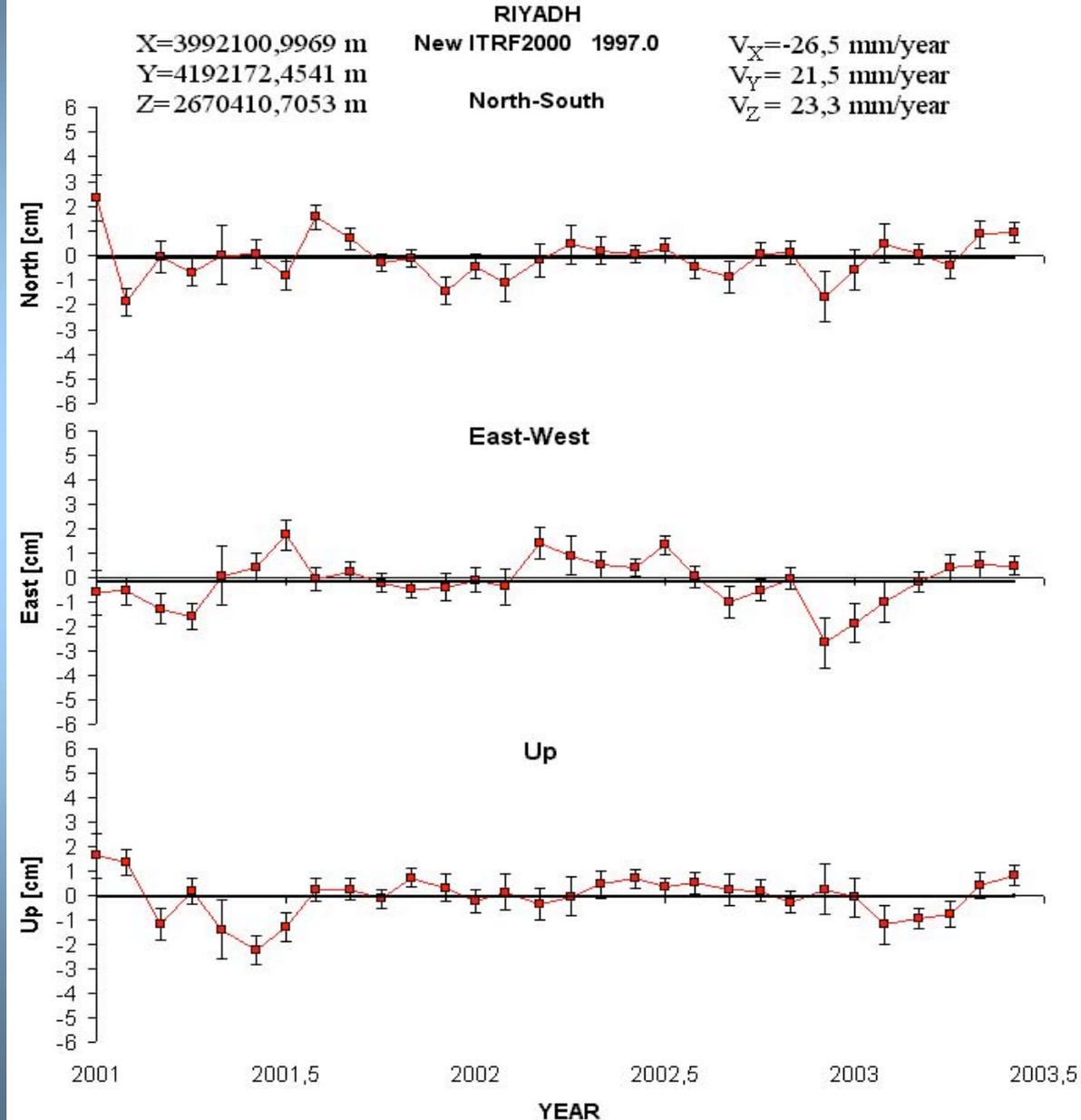
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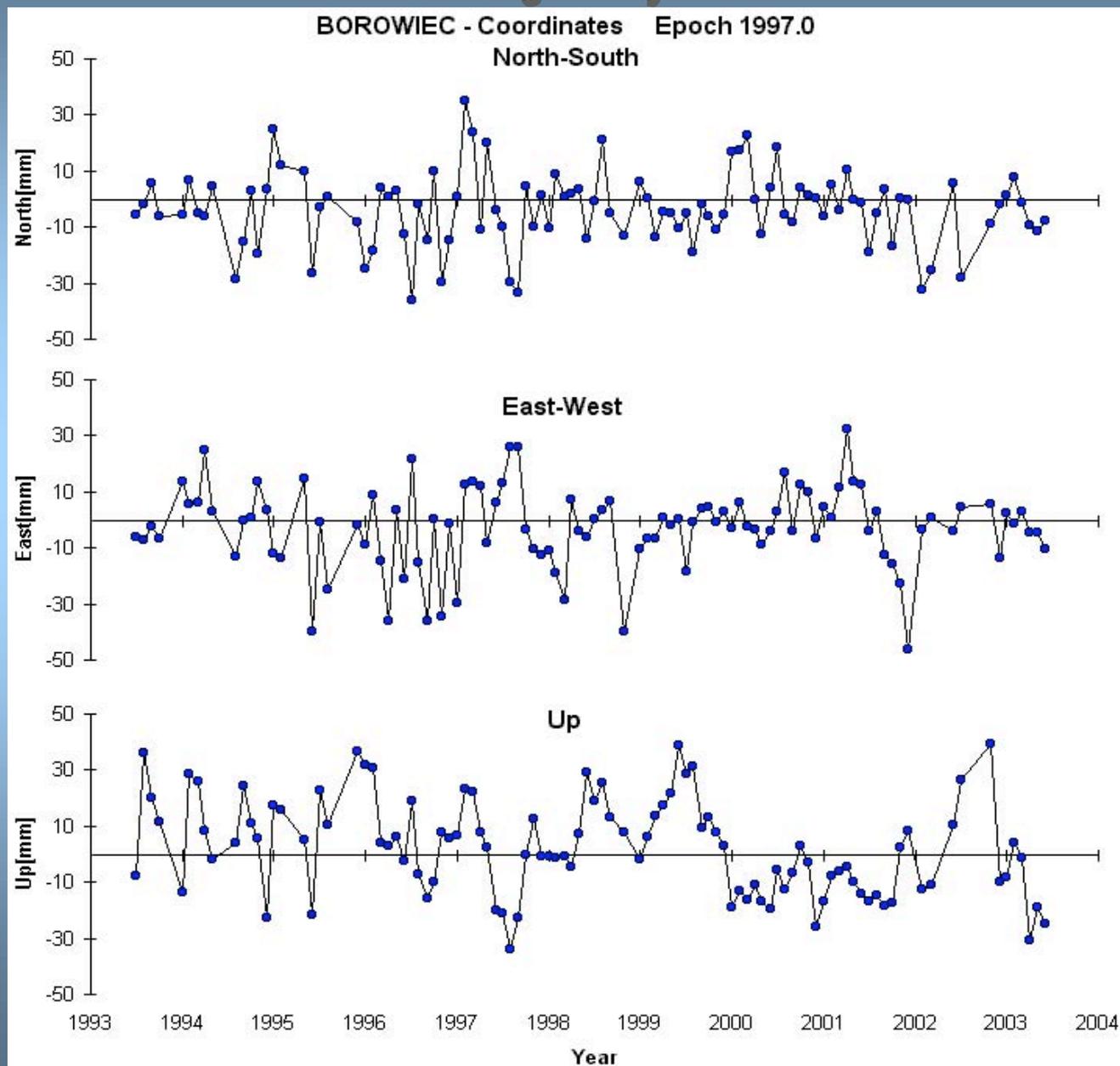
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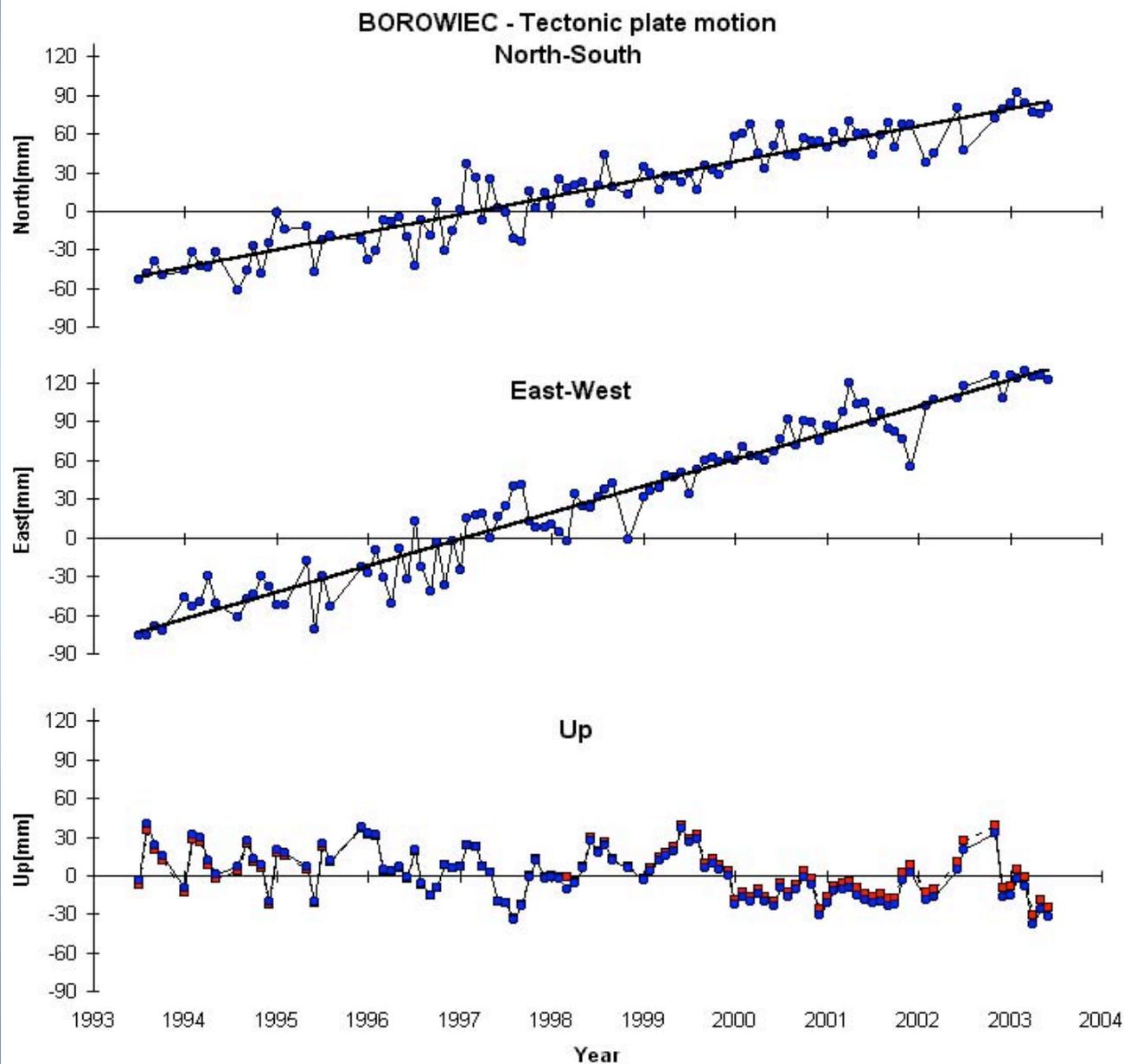
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CONCLUSIONS

- good agreement between orbital results and local geodetic tie for 4.5 years period of GRASSE SLR stations confirm properly parameters and options of the orbital program
- parallel satellites laser ranging by two SLR systems in one site in long time is a good standard for control of the orbital method - accurate (1 mm) geodetic tie for these sites and its periodical control is very important for verification of orbital analysis
- the presented method of QC of the SLR data illustrate variation of the quality (range bias, RMS) and quantity of results on one graph
- important is the number of normal points per station – 50 NP / month is critical for coordinates determination
- very good agreement between orbital RMS and range biases for LAGEOS-1 and LAGEOS-2 for the most stations was detect (for example for stations 7835: 15.3, 15.3; 3.3, 4.7 mm, 7845: 18.5, 18.3; 5.9, 7.1 mm)
- determination of the coordinates velocities in ITRF2000 for new stations is possible with sufficient accuracy only for periods longer than two years



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- the monthly station coordinates for the all SLR stations in the period 4.5 years (1999.0 – 2003.5) are available (sch@cbk.poznan.pl), the 5-year period will be ready in the next few months
- the station coordinates and the tectonic plate motions for the 10-year period (1993.5 – 2003.5) for the more than ten SLR stations will be calculated in the near future – control of the long term or periodical positions change, determination of the changes in velocities and directions of tectonic plates
- near-real time monitoring of the station coordinates is necessary for quick detection of station systematic errors or real position changes
- the orbital program need upgrading for minimize of the orbital analysis effects:
 - new or improved models of satellite and station position perturbations (atmosphere, loading effects, model of Earth gravity field...)
 - new precession-nutation model (IAU2000),
 - new celestial and terrestrial reference system (IAU2000)???
- the author wishes to thank the NASA geodesy group for consent to use of GEODYN-II orbital program