

# Plotting NP range residuals - SGF web development

M. Wilkinson

NERC Space Geodesy Facility, Herstmonceux, UK

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## Space Geodesy Facility

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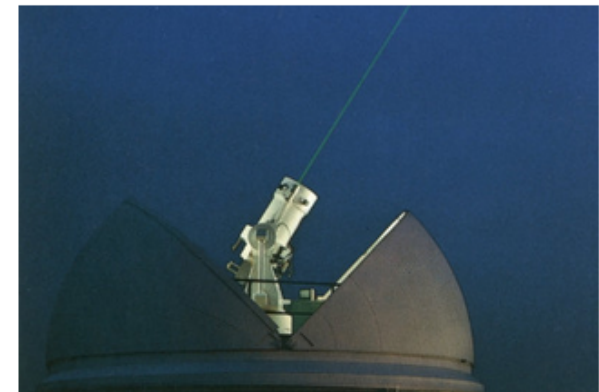
### Welcome to the NERC Space Geodesy Facility

The Space Geodesy Facility operates multiple geodetic techniques to make a major contribution to the formation of a highly-precise global reference frame and supports satellite missions to study the dynamic Earth.

Located near to the village of Herstmonceux in East Sussex, the NERC Space Geodesy Facility (SGF) is actively supporting geodetic and geophysical science.

The SGF makes range observations to enable orbit determination for scientific satellite missions that study the oceans, ice sheets, land mass, gravity field and climate of the Earth in order to better understand the processes at work.

The SGF is part of the International Laser Ranging Service (ILRS) and International GNSS Service (IGS) networks. It is appointed by the ILRS as one of the eight ILRS Analysis Centres and was awarded by the Global Geodetic Observing System (GGOS) the status of 'New Technology SLR Site'.



*Tracking satellites by Satellite Laser Ranging*





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The SGF is part of [Earth Hazards and Observatories](#) research theme under the management of the British Geological Survey (BGS). It is a [Research Facility](#) of the Natural Environment Research Council (NERC) with additional funding from the [Ministry of Defence](#).



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Visit: <http://sgf.rgo.ac.uk/analysis/nporbit.html>

The SGF is an ILRS Analysis Centre and produces a 7-day solution every day from the most recent LAGEOS and Etalon data.

In an effort to provide greater feedback to ILRS stations the range residual of every Normal Point to the final satellite orbits satellite was plotted.

These plots are made available on the SGF website and are updated every day.



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## SGF final orbit NP range residuals

Orbital arcs from the daily NSGF 7-day solution are used to compute range residuals for every Normal Point submitted by ILRS stations.

SLR analysis, using a software package developed in-house over many years (SATAN), of all available laser range data from the LAGEOS and Etalon geodetic satellites is carried out each day to compute tracking station coordinates and Earth orientation parameters.

In the final stages of the analysis procedure, best-fit 7-day arcs are generated using the laser range data observations to LAGEOS 1 and 2 and ETALON 1 and 2 by the ILRS network in that period. The orbital fits typically have a standard deviation of approximately 1-2 cm.

Over a 7 day period these satellites are observed multiple times by many stations as they repeatedly orbit the Earth. LAGEOS observations are usually only prevented by local weather conditions and Etalon, being a more difficult target, is more commonly observed at night.

These residual plots can be used by SLR stations as a diagnostic of range measurement quality on a single Normal Point basis. Particularly valuable in this context are times when more than one station is ranging simultaneously to a given satellite.

