Assessment of SLR Network Performance

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Abstract

The SLR global performance report card is updated quarterly on the ILRS web-site and presents a broad view of the state of the network. The information summarized in that report can be treated in several different ways to clarify particular features. The usual expression of the station characteristics as a function of calendar time provides a method to monitor the evolution of the health of a station by considering the quantity of normal points collected, as well as the volume of full rate observations and the noise level of these data for each satellite. If the same variables are expressed as a function of local time, the distinction between day-time and night-time performance of a station is high-lighted. Satellite signature effects can be demonstrated by again plotting these same variables but as a function of range value, and this will also vary by station. We demonstrate the use of these alternative representations for all the stations in the network to many satellites and solicit ideas which could enhance the definition of the each observatory's contribution to the Global Network and the analyst's understanding of the data.

Introduction

The motivation for constructing graphs of station performance arose from an assessment of potential corner cube array design for HEO satellites. Looking at the SLR data as a function of local time and as a function of the satellite range may reveal station performance characteristics in SLR data such as whether patterns vary from year to year, and whether there are indications of satellite dependencies.

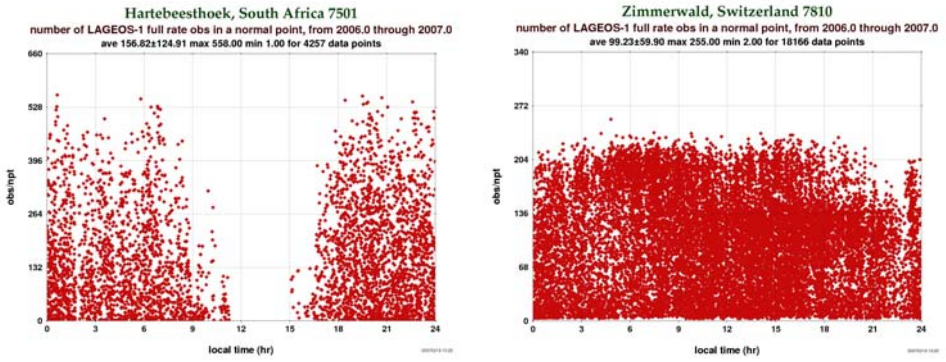

Figure 1 *Number of full rate observations in a normal point for Hartebeesthoek and Zimmerwald.*

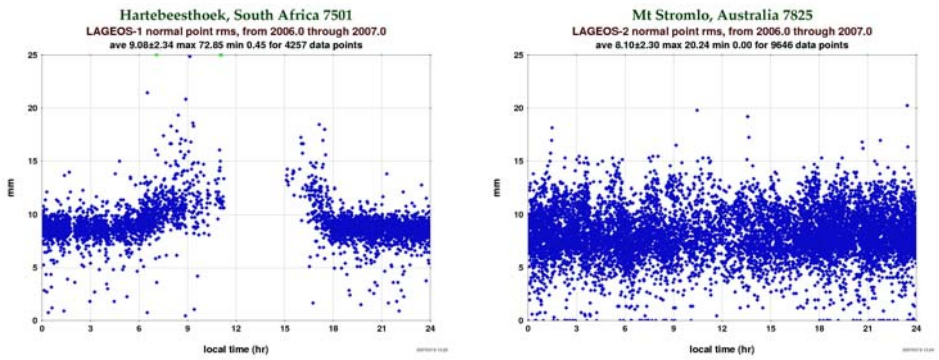

***Figure 2**: Normal point rms as function of local time for Hartebeesthoek and Mt Stromlo.*

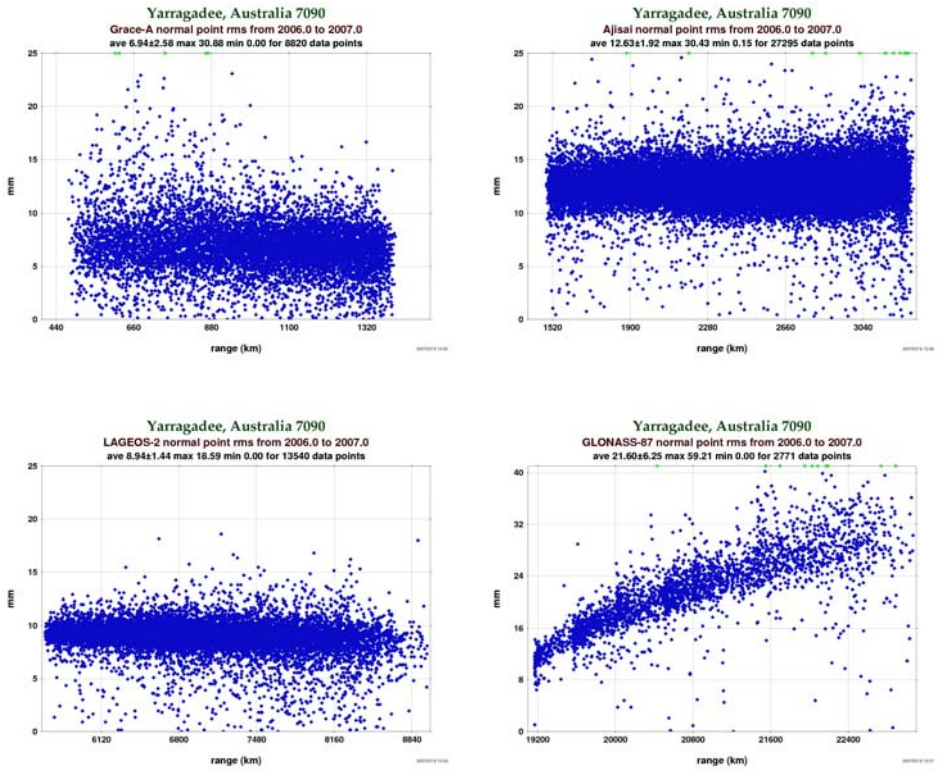

***Figure 3**: Normal point rms as function of range for Yarragadee for Grace-A, Ajisai, LAGEOS-2 and GLONASS-87.*

The pattern seen in the normal point rms as a function of range for Yarragadee tracking GLONASS-87 is most probably due to the large array cross section of GLONASS-87 resulting in center-of-mass offset which is a function of viewing geometry.
See
http://ilrs.gsfc.nasa.gov/cgibin/satellite_missions/select.cgi?sat_code=GL88&sat_name=GLONASS-88&tab_id=com

Plots of this type will be available at the ILRS web site.