

Calibrating GNSS orbits using SLR observations

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Precise GNSS orbits at the centimetre level are routinely generated by the IGS analysis centres using microwave phase measurements. For those GNSS satellites equipped with retro reflector arrays (i.e., all GLONASS and two of the GPS satellites) SLR observations are available in addition and well suited for validating the microwave based GNSS orbits. We present recent SLR validation results of GPS and GLONASS orbits derived from microwave phase observations. Four years (2002-2005) of SLR range residuals have been analyzed. The existing inter-technique biases of several centimetres are addressed. Dependencies of the range residuals on orbit modelling and on the observation scenario are discussed. Seasonal variations of the range residuals with maxima at eclipsing seasons indicate orbit modelling deficiencies for the GPS satellites.