The Blue-Sky Effect (POSTER)

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The omission of the Atmospheric Pressure Loading (APL) may in particular lead to inconsistencies between optical (SLR) and microwave (GNSS, VLBI, DORIS) solutions. SLR observations are carried out during almost cloudless sky conditions, whereas microwave observations are weather-independent. Cloudless weather conditions are typically related to high air pressure conditions, when the Earth crust is deformed by pressure loading. Therefore, weather dependence of the optical observations causes a systematic shift of the station heights, which is called the Blue-Sky effect. Applying APL corrections compensates the Blue-Sky effect.

We estimate the impact of the Blue-Sky effect on SLR stations as the difference between mean loading correction applied to SLR stations, when SLR station performs the observations, and the mean correction to SLR stations for the entire time series.
The impact of the Blue-Sky effect may assume the value up to 5 mm for in-land stations observing occasionally.

Moreover, we study the impact of ocean tidal loading, atmospheric tidal loading and atmospheric non-tidal loading on SLR stations. We found that the repeatability of station coordinates can be improved when loading corrections are considered in the solutions. The loading corrections reduce the amplitudes of annual signal in geocenter coordinates and they increase the consistency between SLR and GNSS solutions.

All error sources leading to larger discrepancies than 1 mm between space geodetic techniques should be taken into account, as the goal of GGOS for the precision of station positions is 1 mm.