At the time of an advent of global and regional navigation satellite systems (RNSS; GNSS), new possibilities arise for the usage of the new navigation signals for the number of constellations. Apart from the civilian usage of GNSS such as navigation, precise agriculture or early warning systems, GNSS observations are used in principle for the realization of the International Terrestrial Reference Frame (ITRF). In terms of the GNSS observations, the current realization of ITRF is based solely on observations from the American Global Positioning System (GPS) and the Russian GLONASS system. GNSS constellations, on the other hand, contain also the systems such as the developed by the European Space Agency together with the European Union the Galileo system, Chinese BeiDou which is in the transformation phase form the regional (BDS-2) to the global system (BDS-3), and also regional systems: Japanese QZSS and Indian NavIC.

The importance of the GNSS can be confirmed based on i.a., it's contribution to the realization of the three Geodesy Pillars: the geometry of the Earth, Earth's rotation and, indirectly, Earth's gravity field. In order to determine global geodetic parameters and perform the ITRF realization using the whole plethora of available GNSS, one has to correctly and precisely determine GNSS orbit parameters for particular systems. This issue has been well recognized for satellites placed on Medium Earth Orbits (MEO). However, the part of the BeiDou system and all satellites of QZSS and NavIC contain satellites which orbit also on Inclined Geosynchronous Orbit (IGSO) and Geosynchronous Orbits (GEO). Moreover, satellites from the system are characterized with different geometric and optical properties thus different satellites interact in a different way for the direct solar radiation pressure, the greatest non-gravitational perturbing force which acts on GNSS satellites.

Satellite Laser Ranging (SLR) is a precise space technique whose principle is based on the time measurements between the moment of the emission of the laser pulse from the laser station and the moment of the signal return after the reflection from the satellite laser retroreflector array (LRA). The time difference multiplied by the speed of light gives the double distance between the satellite and laser station. All currently launched and the planned GNSS satellites are or will be equipped with LRAs. In contrary to GNSS measurements, SLR is based on the optical wavelengths thus SLR is vulnerable to the different type of signal delays and systematic errors. As a result, SLR serves well as an independent validation tool for the microwave products as well as for the precise GNSS orbit determination.

Precise orbit determination is a crucial in the researches of the Earth plane due to the fact that the position of the satellite determination accuracy strongly depends on the accuracies of any analysis based on the satellites measurements. Currently, GNSS orbits are derived using either solely GNSS data or range measurements provided by laser stations of the International Laser Ranging Service (ILSR). When compared the orbit determination results using separately both techniques an inconsistency is visible in the determination of the satellites positions, therefore the combination of SLR and GNSS data may be crucial for the increase in the consistency between the two techniques.

The great advantages of range measurements are the mm-level accuracy of ranging and little vulnerability on systematic errors for suffering from GNSS. SLR does not require the coping with satellites clocks, ambiguity resolution or changes of the antenna phase center. On the other hand, SLR is sensitive to the weather condition, because it can be performed only during cloudless weather conditions. Taking into consideration all the above-mentioned aspects the accurate orbit solution may obtain integrating both SLR and GNSS observations.

The combination of the two independent space techniques onboard the GNSS satellite not only allows for the precise GNSS orbit determination but also enables the co-location of GNSS and SLR onboard the satellite providing the physical linkage between two techniques thus will provide an increase of the consistency between the two space techniques.