ESA's Genesis mission - from an ILRS prespective

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The International Terrestrial Reference Frame is the fundamental backbone for numerous geoscientific disciplinces as well as for various societal applications. Thereby, a special requirement to the ITRF is the ensurance of a sustainable long-term accuracy of about 1mm with 1mm/decade stabilty. Nowadays, state-of-the-art ITRF solutions realize an accuracy which is about two to five times worse. The ITRF is realized by combining the measurements from the global network of GNSS, VLBI, DORIS, and SLR stations. The combination of these different data sets is limited by the sparse co-location of the four space geodetic techniques and inaccurate/outdated local-tie surveys. Genesis, a planned satellite of the European Space Agency (ESA) will allow for a co-location of all space geodetic techniques in space, i.e. on one common stable satellite platform. It's launch is planned for 2028. Genesis will be a dynamic space geodetic observatory carrying all the geodetic instruments referenced to one another through carefully calibrated space ties. A primary goal of ESA's satellite mission is to solve the inconsistencies, systematics and biases between the different geodetic techniques in order to reach the ITRF accuracy and stability goals endorsed by the various international authorities and the scientific community.

This paper provides an overview about the current and future status of the tracking network of the International Laser Ranging Service (ILRS) which will be responsible for the organisation of the operational Genesis tracking as well as for potential scientific coordinated tracking campaigns (e.g., via simulation studies). Moreover, technical requirements for the satellite retro-reflector-array and the quality of the daily CPF predictions will be discussed to ensure an optimal contribution of SLR measurements to Genesis for the global ITRF solution.