Yebes Laser Ranging Station (YLARA), development status 2022

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Yebes Observatory (OY) has been working for years on the construction of a Fundamental Geodetic Station that fulfils the requirements of the GGOS project. Currently, the Observatory host a RAEGE/VGOS radio telescope in operation since 2016, GNSS receivers, a gravimetry laboratory (with absolute and relative superconducting gravimeters), time and frequency systems and a local tie network.

At the beginning of 2018, funds for the construction of an SLR station at Yebes, coming from the European Regional Development Fund (ERDF), were approved. Including this technique, OY will become a GGOS Core Site.

The main objective of YLARA station is to perform geodetic observations contributing to the ILRS network, but a second application is already under development. The station will be equipped with a dedicated laser system for space debris observations, since the beginning of its operation.

The design of the system is based on the SLR stations classic design including a biaxial telescope with a Coudé focus and a conditioned room fully prepared for a laser system installation. However, the design also complies with the state of art of the SLR technique and the operation of the station for SLR observations will be done using a laser package installed in a piggy back configuration. The system will use a two color laser, 532 nm and 1064 nm, with a repetition rate of 1 kHz. The detector package, with a C-SPAD and an IR-SPAD detector, will be also installed on the telescope mount.

Currently, most of the main subsystems have been completed and factory tested, just the telescope assembly is close to completion and will be tested by the end of this year.

It is planned to have every subsystem installed at Yebes in spring 2023, starting observations by summer.