SAN FERNANDO LASER STATION: Latest upgrades and news.

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The connection of San Fernando observatory with laser telemetry comes from 1968 when it was installed a Ruby laser by the French Group des Recherches de Geodesie Spatiale (CNES-GRGS).
In 1983 the old SLR station was installed at the top of San Fernando observatory main building. Several improvements and changes were done through years in a way that at 2013 almost every piece of it had been changed. A 10 Hz, 532 nm Yag-Nd laser was operating at 250 mW. On July 2017 we dismounted this already old laser and installed two new laser benches.

Our new Task Force

A NL 319 EKSPLA for SST activities:
Pulse energy at 532 nm: 2.5 J.
A 8 ns average pulse width.
Beam diameter: 21 mm.

PL 2251C EKSPLA:
Pulse energy at 532 nm: 50 mJ.
Pulse duration: 30 ps.
Beam diameter: 12 mm.

Optics

Important changes and updates in the optical framework were accomplished to increase the efficiency and return of SLR telescope.
Several optical elements were rearranged and/or fine-tuned.
Most of them replace with modern high-efficiency components.
Some adjustment at optics to assure minimum divergence: 20 arcseconds FWHM.
The fact that two different beam has to coexist means that some changes has to be done:
To change the Beam expander to allow 21 mm diameter beam.

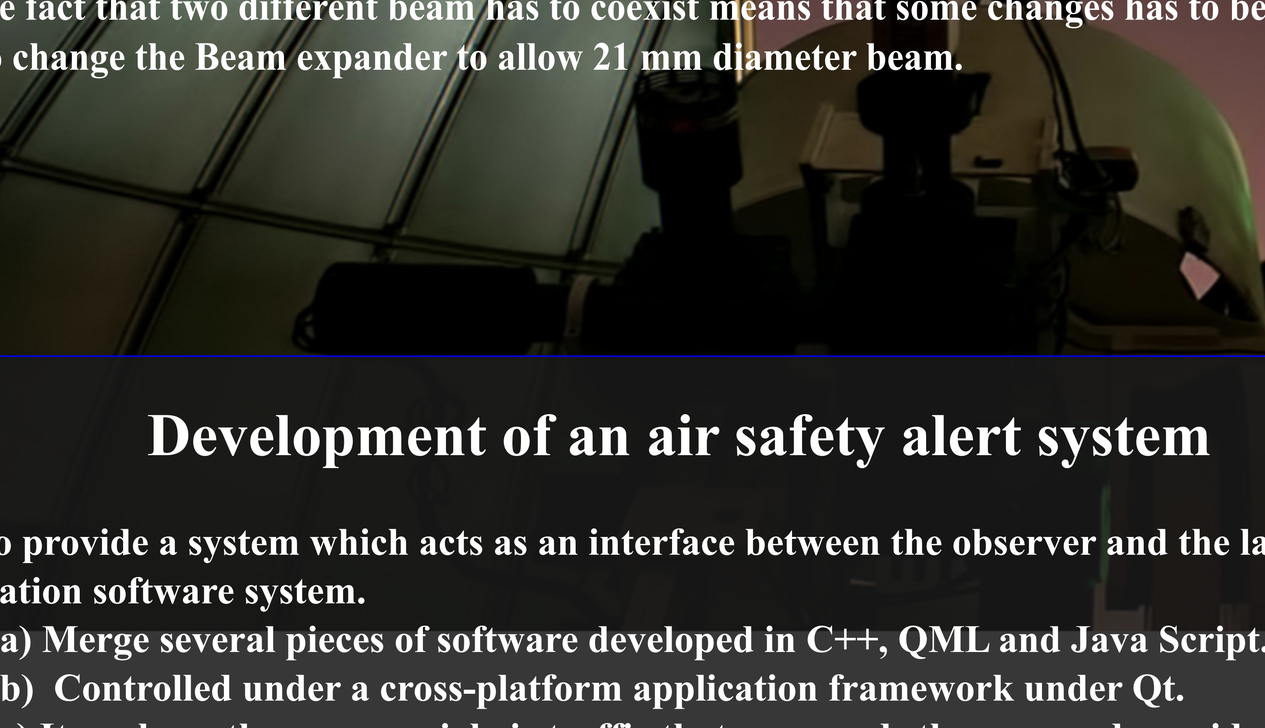
The first laser is dedicated to space debris tracking.

It is fully operative and contributes as an asset to the Spanish contribution to the European Union SST programme.

Below are figures obtained along 2018.

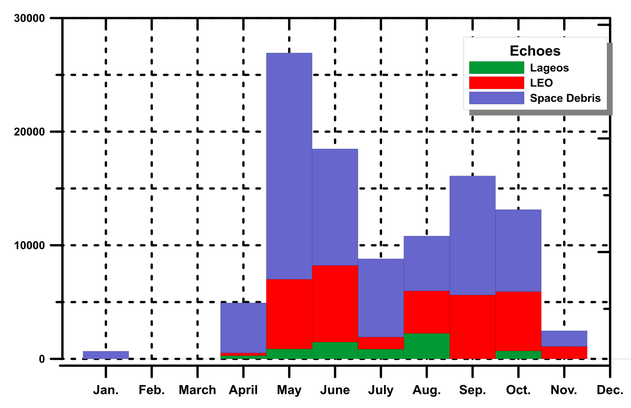
Development of an air safety alert system

To provide a system which acts as an interface between the observer and the laser station software system.
a) Merge several pieces of software developed in C++, QML and Java Script.
b) Controlled under a cross-platform application framework under Qt.
c) It analyses the commercial air traffic that surrounds the area and provides alerts. obtain infromation in ADS-B format (Automatic Dependent Surveillance - Broadcast).



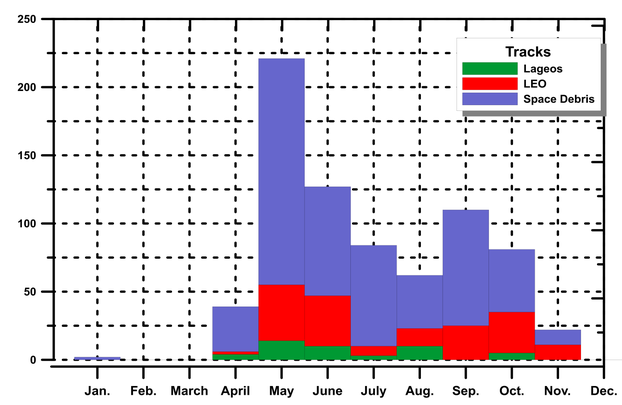
Statistics

Number of echoes



Year 2018

Number of tracks



Next actions

To finish with the PS 2251 laser bench integration and start normal operations.