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### **Tracking up to geostationary satellites with 15uJ laser and 70cm standard astronomical telescope**

The SP-DART (Single-Photon Detection, Alignment and Reference Tool) developed in Graz works as a tiny mobile SLR station. It consists of a transmitting module (15  $\mu$ J / 1 ns / 2 kHz laser) and a detection package (laptop, FPGA-based control unit, Riga ET, GNSS Time & Frequency unit, meteorological instruments), but without mount / receiving telescope. The main goal of SP-DART is to align and calibrate the receiving channel of any satellite or debris laser ranging system in order to reach optimum single-photon performance. Furthermore it could also upgrade e.g. an astronomical telescope to a passive-only, multi-static ranging or light curves measurement station. Using such an SP-DART, an experiment was carried out recently in Sandl, Austria, with a 70 cm diameter astronomy telescope from ASA (Astrosysteme Austria) company. The transmitting module was mounted on the telescope, and two additional detectors were aligned for laser ranging and light curve measurements individually. The mount / telescope system was remote-controlled from Switzerland. After a very short setup time (6 hours), several passes were tracked in the first night, e.g. Lageos, Beacon-C, Starlette. During the second night, HEOs up to the geostationary satellite Compass-I5 were tracked successfully with the tiny 15  $\mu$ J laser. Furthermore the periodical spinning of Glonass 041 was derived from simultaneous light curve measurements. A fully remotely controlled SP-DART is going to be installed now in this Sandl telescope for single/multi static satellite and debris tracking, and for light curve recording.