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Enhanced satellite laser ranging project

ESLR is a satellite laser ranging project that incorporates several technological advances offering a number of attractive new features: - An advanced calibration and testing system for a faster alignment process before and during ranging; - Ranging of small one and/or set of closely spaced objects (space debris) - Additional data from the field sensor for orbit calculations. The modularity of the system allows for easy modification and step wise upgrade of the instrument. - Advances to the telescope construction together with the telescope apparatus autocollimator system allows for improved interoperability enabling the ESLR to obtain additional space object's coordinates in real-time. - Simple and reliable design of the system ensures that it is easy to set-up, adjust, align and transport - The overall system performance enables for precise observation of objects at lunar distance and beyond. ESLR project advantages are based on the use of multiple novel approaches: 1. The telescope's main optical system (primary mirror >630 mm) has aberration free long direct focus (~32 m), transmission channel for better outgoing laser beam collimation (<2 arcsec in the far zone) and another focus (~4.6 m) for receiving and control channels. 2. Specific design of the telescope's optical and mechanical systems allows the use of a high-power laser 3. The new event timer is based on Digital Signal Processing, results in high performance and reliability. 4. ESLR operation software is highly automated and has easy-to-use central operator interface to command and control