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Concept of a modular, multi-laser, multi-purpose SLR station

We propose a concept for a modular SLR station, using a standard astronomy telescope with an aperture of 80 - 100 cm, on an Az/El mount suitable for tracking satellites from LEO up to GEO. This system is able to carry up to 100 kg additional load. Various lasers can be fixed directly on this mount / telescope system: From 2 kHz / 15 μ J (SP-DART) for routine GNSS ranging, a 10 ps / 400 Hz laser for high precision SLR, up to a 100 Hz / 200 mJ (20 W, for Space Debris) laser system. The receiver optical bench is fixed on the receive telescope, and offers place for several different detection packages - including a single-photon light curve detection unit. This concept avoids any Coudé path, eliminating several common transmit path restrictions: No wavelength restrictions, no power restrictions, no repetition rate restrictions. All lasers – including the light curve detection system - could be operated simultaneously, if necessary. Alignment problems of the laser beam(s) are significantly reduced. Such a modular, multi-laser SLR system can be used for automatic / remote-controlled routine GNSS tracking, light curve recording, space debris tracking, and for standard high accuracy SLR – all of that at a significantly reduced cost.