Light Curves (Photometry) as a function of time illustrate the average intensity of reflected sunlight by the observed targets. Graz SLR station established such a low cost measurement system since 2015 with single photon detector and FPGA circuit, concentrating on the wavelength band of 780–930 nm, allowing simultaneous operation with SLR. Only the number of photons per bin (adjustable from 20 μs ~ 1s) are stored into PC, which extremely compacts the data with an overwhelming advantage at this point compared with imaging techniques. Several kinds of targets - from low earth orbit up to geostationary satellites, including debris – have been measured in Graz, e.g. Ajisai, TOPEX/Poseidon, Envisat, more than 40 defunct Glonass, COSMOS, Compass GEO, R/B, etc. It turns out that the shape, the current status and the variation along time of spin rate or attitude can be yielded out of light curves.

1. Defunct Satellites

![Diagram of light curves for defunct satellites](image)

Spin periods for 42 Glonass satellites determined by SLR only (green), light curves only (red) or SLR and light curves simultaneously (blue).

2. Satellite Topography

![Diagram of satellite topography](image)

Phase folded pass of Ajisai (April 2016, spin period 2.3s). The bursts of the solar flashes produced by the single mirrors can be distinguished. The maximum satellite elevation above the horizon during the pass is 74.6° and the satellite ellipse is indicated by the black end of the elevation axis. The maximum LC peak is due to the reflection anomaly from a single mirror and a set of weaker flashes from the glassy CCRs - the yellow and green rectangles indicate the burst prediction area.

3. Debris Targets

- Maximum SLR residuals ↔ Small light curve peaks
- Minimum SLR residuals ↔ Large light curve peaks
- Maximum SLR offset: approx. 13 meters
- Cylinder axis roughly parallel to line of sight
- Sunlight reflection from top/bottom cylinder surface
- Large LC peaks: Sunlight reflection from cylinder jacket (SLR Minimum)
- Small LC peaks: Sunlight reflection from top/bottom surface
- Periodical offset SLR ↔ rotation about center of mass

Reference
1) [http://www.johnstonarchive.net/astro/satview.html](http://www.johnstonarchive.net/astro/satview.html)