Vera C. Rubin Observatory – Impact of Satellite Constellations

July 22nd 2019

As an astronomical survey that depends on dark skies for its core science, LSST is concerned about plans for the large-scale deployment of low Earth orbit (LEO) satellite constellations. Starlink may be only the first in a series of new technologies that could impact ground based astronomy. We believe that the design and implementation of these constellations should be undertaken in consultation with the astronomical community to minimize their impact.

LSST is particularly sensitive to bright trails of these satellites, due to LSST's unprecedented product of field-of-view and light collecting area. Most LSST images will contain such a trail if plans for multiple LEOsat constellations materialize. The first group of Starlink satellites are sufficiently bright during dawn and dusk (when LSST would be surveying) that the trail would exceed sensor saturation, generating uncorrectable artifacts in the data. If instead these satellites were painted flat black making them a factor of 25 fainter, satellite trails should be less of a challenge for LSST due to its specific design.In that case LSST's frequent imaging of the same region of sky will provide enough data to correct for unsaturated satellite trails or other anomalies.

For a discussion of broader impact of satellites on research in astronomy, please see a statement on satellite constellations by the International Astronomical Union, which LSST fully endorses, at https://www.iau.org/news/announcements/detail/ann19035/