

Daylight Space Debris Laser Ranging

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ABSTRACT

A precise knowledge of the orbit of space debris objects is essential for the implementation of removal strategies and for reentry predictions. Satellite laser ranging provides highly accurate distance and attitude measurements of tumbling objects. Due to inaccurate TLE-based predictions it is however necessary to optically identify space debris objects. Currently space debris laser ranging is limited to a few hours after sunset and before sunrise when the object is in sunlight and it is dark at the observing site. We present a method to visualize space debris targets in broad daylight which significantly extends the potential observation time. The gathered image of the space debris object is analyzed correcting inaccurate orbit predictions in realtime. After centering the target in the field of view the standard laser ranging search routine is started. First daylight space debris laser ranging results to upper stage rocket bodies are shown.