

SPACE DEBRIS SYMPOSIUM (A6)
Operations in Space Debris Environment, Situational Awareness (7)

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A COLLABORATIVE SPACE-GROUND DEBRIS OBSERVATION STRATEGY: A PRACTICAL
EXAMPLE SIMULATION.

Abstract

The proposed collaborative Space-Ground observation strategy, is based on a preliminary orbit calculation of target objects observed with the payload to be successively passed to ground in order to activate a dedicated tracking activity allowing to refine the preliminary orbital parameters up to the necessary accuracy.

Due to advanced orbit determination techniques available today, it is possible to calculate a preliminary orbit by means of only two observations, in lieu of the three classically required.

With the objective to assess this methodology, we performed a preliminary simulation, concerning the possibility to obtain a couple of synchronized observations of a well recordable target, i.e. the LARES satellite, by means of NEOSAT and SAPHIRE instruments. The selected target and instruments allowed in practice to evaluate an actually possible experiment.

In this view we evaluated the possibility to observe the target during short time windows from both instruments, reaching apparent magnitudes of the target (LARES) down to Vmag 9-10, with combinations of 12 Vmag for both observing instruments in simultaneous observation.

From the outcomes of the simulations it was possible to assess that this methodology can become particularly effective when associated to the advanced observation capabilities we are developing on Ground, offering very large FoV (up to 44 square degrees) combined with large aperture and seeing limited optical resolution, thanks to the Fly-Eye Technology.

Due to the preliminary promising results we think that this approach can represent an effective domain of collaboration between Space and Ground based assets.