

14TH IAA SYMPOSIUM ON SPACE DEBRIS (A6)
Orbit Determination and Propagation (9)

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SPACE DEBRIS POPULATION ON THE LARES SATELLITE ORBIT

Abstract

The Italian Space Agency LARES satellite has been launched in 2012 with the qualification flight of VEGA. The satellite is passive and is tracked by about 50 stations of the International Laser Ranging Service. The main mission objective is to test frame-dragging of general relativity. During the four years in orbit four close approaches have been notified by The United States Joint Space Operations Center (JSpOC). The evaluation of distances were affected by high uncertainties. It will be shown in the paper that with a more accurate ephemerides evaluation of LARES satellite, distances were actually larger. Nevertheless the issue of space debris is of concern for LARES satellite. Unfortunately, three out of the four space debris are older than 30 years and the fourth one is unknown (maybe it is a part detached from a main object). That implies it will be probably not possible to maneuver them, so that in case a collision will be predicted, nothing can be done to avoid it being also LARES without propulsion and attitude control. This situation will make difficult to assess responsibilities in case a collision would occur. Some legal issues will be examined in the paper. An assessment of the collision risk with the known and estimated debris population at 1450 km altitude orbit with LARES satellite will be performed along with an evaluation of the relative velocity involved in the predicted impact. This last parameter will allow to determine the possible damage to the satellite, the relevant production of further debris and the variation of the orbital parameters of LARES satellite induced by the impact.