

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
New Materials and Structural Concepts (4)

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MATERIAL AND SURFACE PROPERTIES OF LARES SATELLITE.

**Abstract**

LARES (LAsER RElativity Satellite) is a passive satellite put in orbit by the VEGA launcher the past 13th of February 2012. It is designed for the accurate test of frame-dragging and Lense-Thirring effect. This phenomenon is induced by the Earth rotation that according to Einstein General Relativity drags space-time and consequently the trajectory of orbiting objects. In order to reach the expected results of few percent accuracy in the measurement of that effect, some restrictive scientific requirements have been imposed with regard to the material to be used for the satellite body (SB) and to the surface properties of the SB itself, giving special attention to the density of the SB (higher than  $17900 \text{ kg/m}^3$ ). Furthermore to reduce interaction with the magnetic field of Earth some upper limit to, the electrical conductivity of the alloy was specified. All those aspects along with some considerations on the manufacturing challenges of LARES will be reported. Finally the different methods evaluated for the finishing of the SB, so as to satisfy the scientific requirements such as the infrared emissivity ( $\varepsilon$ ) and the solar absorptivity ( $\alpha$ ) of the surface will be analyzed.