

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

Author: Prof. Antonio Paolozzi
Sapienza University of Rome, Italy, Antonio.Paolozzi@uniroma1.it

Prof. Ignazio Ciufolini
Università del Salento, Italy, ignazio.ciufolini@unile.it
Prof. Ferdinando Felli
University of Rome "La Sapienza", Italy, ffelli@metal1.ing.uniroma1.it
Mr. Andrea Brotzu
University of Rome "La Sapienza", Italy, ffelli@metal1.ing.uniroma1.it
Mrs. Daniela Pilone
Italy, daniela.pilone@uniroma1.it
Mr. Cristian Vendittozzi
Sapienza University of Rome, Italy, c.vendittozzi@gmail.com

ISSUES ON LARES SATELLITE MATERIAL

Abstract

LARES satellite body will be the first orbiting object made entirely of tungsten alloy. The choice of this high density material causes a very small surface-to-mass ratio for the satellite. This characteristics make surface perturbations small and the experiment more accurate. Due to the peculiarity of the material used for the satellite, the main properties of the alloy have to be verified against the characteristics declared by the producer. The surfaces of the two spheres to be used for manufacturing the demonstration model of LARES and the flight model of LARES will be analysed with the aim of understanding the homogeneity of the bulk material. Mechanical tests will be carried on employing small size specimens taken from the two appendices of the two tungsten alloy spheres. The alloy has been prepared by the manufacturer using liquid sintering technique. Since the producer could not guarantee control on the metallic phase distribution we will perform an accurate metallographic analysis on specific specimen of the alloy. The micro-structure will be characterized with Scanning Electron Microscopy (SEM) and the phases will be analysed with Energy Dispersion Spettroscopy (EDS). Micro-hardness analysis on the several phases will be also performed. Particular interest will be devoted to the micrographic analysis of the tungsten alloy screws of the cube corner reflector mounting system.