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ULTRATHIN EUV FILTERS TESTING AND CHARACTERIZATION UNDER HIGH FLUX (13 SC) FOR SOLAR ORBITER EUI INSTRUMENT

Abstract

The test and characterization of ultrathin EUV filters under high solar flux is presented. These 150nm thick aluminium filters are used at the entrance of the Extreme UV Imager (EUI) payload, which is developed at the Centre Spatial de Liège for the Solar Orbiter ESA M-class mission. The solar flux that they shall have to withstand will be as high as 13 solar constants when the spacecraft is its 0.28AU perihelion. A specific design based on additional ribs has therefore been developed to enhance the thermal behaviour and heat evacuation while preserving its optical properties.

It is essential to assess the design performances under the Solar Orbiter high solar flux. Therefore, thermal vacuum test under 13 solar constants will be performed. The filters temperature profiles will be measured during the tests through infrared imaging. A thermal correlation of the test will then be performed to deduce the filters actual thermal properties to be used in the global instrument geometrical and thermal mathematical models.