

THE SOLAR ORBITER MISSION: INTA CONTRIBUTIONS TO PHI AND METIS INSTRUMENTS

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Introduction:

INTA has relevant contributions to the development of two optical instruments on board Solar Orbiter: SO/PHI (The Polarimetric and Helioseismic Imager for Solar Orbiter)¹ and METIS (Multi Element Telescope for Imaging and Spectroscopy).

SO/PHI is an imaging spectro-polarimeter that will acquire high resolution solar magnetograms. SO/PHI consists of two telescopes: the High Resolution Telescope (HRT), and the Full Disk Telescope (FDT) and it shall be able to measure the polarimetric state of the incoming light for both telescopes. On the other hand, METIS is a solar coronagraph that will analyze the linear polarization for observations of the visible-light K-corona.

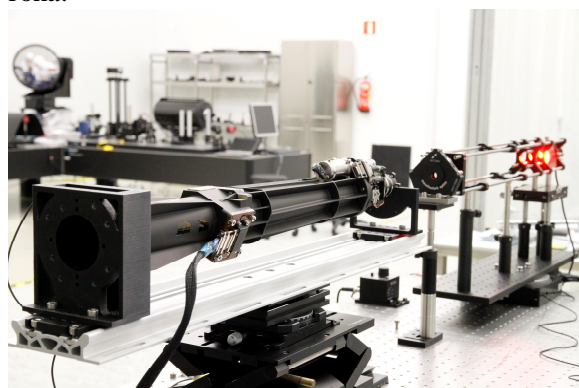


Figura 1: Optical verification of the SO/PHI Full Disk Telescope (FM).

INTA has developed the SO/PHI FDT including its refocusing mechanism (FRM)² as well as its Heat Rejection Entrance Window (HREW). Additionally, INTA has developed the Polarization Modulation Packages (PMPs)^{3,4} for the FDT and HRT telescopes based on Liquid Crystal Variable Retarders. They will be used as polarization analyzers for the first time in a space mission, up to our knowledge. A modified version of this device will be also used for METIS. Finally, the INTA responsibilities also include the space qualification of the lithium niobate etalon used in the tunable spectral filter (FG, Filtergraph) and the radiation analysis for SO/PHI.

Recently, the units corresponding to the FM (Flight model) of the SO/PHI and METIS instruments have been delivered and successfully integrated and verified. Moreover, the performances at instrument level during the final testing and verification have been excellent.

In this talk the details about this final phase will be described as well as the status of the remaining activities.

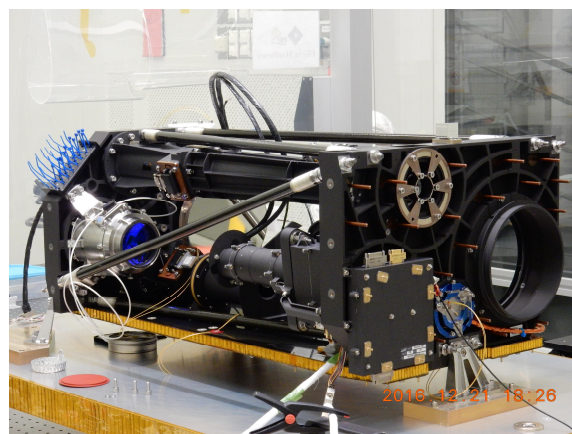


Figura 1: SO/PHI FM Optical Unit with all the subsystems integrated.

References:

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3. A. Alvarez-Herrero et al., "Polarization modulators based on Liquid-Crystal Variable Retarders for the Solar Orbiter mission," presented at Proc. SPIE, Polarization Science and Remote Sensing VII, 9604-27, 2015.
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<https://www.cosmos.esa.int/web/cpess-5/abstract-submission>