

EChO SWiR: Exoplanet atmospheres Characterization Observatory Sort-Wave infraRed channel of the EChO payload.

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Abstract.

EChO, a space mission for exoplanets exploration, is considered the next step for planetary atmospheres characterization. It will be a dedicated observatory to uncover a large selected sample of planets spanning a wide range of masses (from gas giants to super-Earths) and orbital temperatures (from hot to habitable). All targets move around stars of spectral types F, G, K, and M. EChO will provide an unprecedented view of the atmospheres of planets in the solar neighbourhood.

The consortium formed by various institutions of European countries is proposing an integrated spectrometer payload for EChO covering the wavelength interval 0.4 to 16 μm . This instrument is subdivided into 5 channels: one visible and near-infrared module (0.4-2.45 μm), which includes a fine guidance sensor (FGS) and a VIS-NIR spectrometer, a near infrared channel (SWiR, 2.45-5.45 μm), 2 middle infrared channels (MWiR, 5.2-8.5 & 8.5-11.5 μm), and a long wave infrared module (LWiR, 11.5-16 μm). In addition, it contains a common set of optics spectrally dividing the wavelength coverage and injecting the incoming light into the different channels. The proposed payload meets all of the key performance requirements detailed in the ESA call for proposals as well as all scientific goals.

In this paper, the optical and mechanical designs of the SWiR channel, including the identification of critical elements and a brief summary of the optics and detector requirements are reported on.

Key words.

Exoplanets, Atmospheres, Payload

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