The EChO Visible and Near Infrared spectrometer

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Abstract

EChO (Exoplanets Characterization Observatory) is one of the ESA M3 Cosmic Vision missions selected for the assessment phase. EChO would observe and study the atmospheres of extra-solar planets with unprecedented sensitivity to life-marker gases, in a range of physical conditions down to habitable rocky planets (super-Earths) around dM stars. A substantial fraction of such planets are seen transiting their host stars, and they are the best targets for the EChO mission. EChO would be a spaceborne observatory that it would be placed in the L2 lagrangian point and it would be equipped with different module spectrometers to cover the spectral range between 0.55 and 11.00 μm as requirement and a possible extension as goal to the interval 0.4-16.0 μm.
The EChO Visible and Near Infrared (VNIR) spectrometer would be able to cover the spectral range between 0.4 and 2.5 μm. It has to be designed to assure a resolving power of about 320 over whole spectral range. VNIR would be a spectrometer in a cross-dispersed configuration by using a combination of a diffraction grating and a prism to spread the light in different wavelengths and in a useful number of orders of diffraction. It would use a Mercury Cadmium Telluride 256x256 pixels detector to satisfy the requirements of low thermal noise and the EChO system to operate at the working temperature of 40-45K. The instrument will be interfaced to the telescope optics by optical fibres to assure an easier coupling and an easier colocation of the instrument inside the EChO optical bench.

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