



Science objectives of the VenSpec-U channel on board EnVision

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EnVision has been recently selected by ESA as a Cosmic Vision M5 finalist. This mission aims at characterizing the evolution and activity of our neighbouring planet Venus: is Venus still active today? What is its internal structure? How did it evolve (habitability, weathering, resurfacing)? How are volatile species coupled between interior, surface and atmosphere? In order to answer these science objective, the payload onboard EnVision low-Venus orbit platform consists of an interferometric radar (InSAR), a subsurface sounder (SRS) and a spectrometer suite known as VenSpec, consisting of three channels: VenSpec-M, VenSpec-H and VenSpec-U.

VenSpec-U is a dual UV spectral imager (190-380 nm @ 2 nm; 210-240 nm @ 0.2 nm) aiming at measuring SO₂, SO and the yet unknown UV absorber on day side cloud top of Venus. It is known from past observations, from orbiters such as Pioneer Venus and Venus Express and Earth-based telescopes such as IRTF and HST that SO₂ and SO are both highly variable species, spanning at least two orders of magnitude over timescales ranging from a few hours to several decades. The physical origin of this variability is poorly constrained (volcanic plumes and/or atmospheric oscillations), and VenSpec-U, with its unprecedented accuracy, spatial and temporal coverage, will be able to provide valuable answers.