

Venus cloud top as observed by SPICAV-UV/Venus Express: SO₂, O₃ and clouds

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SPICAV [Bertaux et al., 2007] was a UV and IR spectrometer on board Venus Express, ESA's first mission in orbit around Venus (2006-2014). Observations of the reflected UV sunlight (170 to 320 nm, $R \sim 200$) by SPICAV during the whole mission were sensitive to many variable quantities near Venus' day side cloud top (65 – 75 km): gaseous constituents such as SO₂ [Marcq et al., 2011, 2013] and O₃, UV absorption caused by a yet unknown UV absorber within submicron particles, cloud top altitude (via CO₂ absorption).

Here we present the first full analysis of the complete SPICAV-UV nadir data set. First findings include: (i) detection of ~ 10 ppb cloud top O₃ at latitudes higher than 50° [Marcq et al., in prep.] (ii) confirmation of most of the spatial and temporal trends of SO₂ climatology as described by Marcq et al. (2013, 2011) and other observers [Jessup et al., 2015 ; Encrenaz et al., 2012, 2013, 2016]: short-lived bursts of SO₂ at lower latitudes, happening more often in the 2006-2009 epoch (iii) spatial and temporal variations of the UV absorber embedded in mode 1 particles, with darker lower latitudes and a possible secular darkening.