

UV albedo of Venus clouds as measured onboard the VEX orbiter

Denis Belyaev (1), Nikolay Ignatiev (1), Emiliano D'Aversa (3), Jean-Loup Bertaux (1,2), Giuseppe Piccioni (3), Robert Carlson (4), Pavel Vlasov (1), and Valeria Kolmogorova (1)

(1) Space Research Institute (IKI), Russian Federation (bdenya.iki@gmail.com), (2) LATMOS, Paris, France, (3) Istituto di Astrofisica e Planetologia Spaziali, Roma, Italy, (4) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, USA

Venus clouds possess high spherical albedo (70-80%) in the visible spectral range, and the planet disk looks very bright and homogeneous. From the other hand, the ultraviolet (UV) albedo is 2-3 times lower and the clouds appear to be in contrast. The dark spots point out to presence of some cloud components that absorb solar radiation at wavelengths from 250 to 400 nm. One of molecules is sulfur dioxide (SO_2), which varies from 0.1 to 1 ppm at the cloud top [1, 2]. Other candidates are also sulfur-bearing species, sulfur S_x with different valences [3], and even FeCl_3 [4]. So far, there was no published precise measurement of Venus albedo in spectral range 200-400 nm that would allow retrieval the unknown UV absorbers of Venus clouds.

In the present work we perform data processing of two spectrometers that measured UV albedo of Venus clouds onboard the Venus Express (VEX) orbiter in 2006-2014. UV channel of SPICAV operated at 115-320 nm [5], while UV-VIS channel of VIRTIS covered 300-1000 nm [6]. We have selected a few tens of simultaneous nadir observations with similar pointing that allows us combining the clouds reflectance spectra at 200-400 nm. At the moment, spectral and absolute radiance calibrations are being performed for correct merging of spectra between two spectrometers.

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