Geophysical Research Abstracts
Vol. 20, EGU2018-16084, 2018
EGU General Assembly 2018


# Retrieval the gaseous composition of Venus night-side mesosphere with SPICAV UV onboard Venus Express

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A stellar occultation database accumulated for the first time by the UV channel of the SPICAV instrument onboard Venus Express mission covers an annual range of 2006-2014. During these observations spectra of stellar light partly absorbed in the atmosphere were measuring while the star was ascending or descending in the field of view of the instrument. Vertical profiles of gaseous concentrations of the night Venus atmosphere are able to be retrieved from one orbit set of observations. The instrument worked in wavelength range of 118-320 nm which covered absorption bands of $CO_2$ and some minor gases ($SO_2$, $O_3$). However, the instrument was also sensible to various emission coming from extended sources: nitric oxide (180-280 nm), Lyman-$\alpha$ (121.6 nm) and reflected sun light. A correct separation between one stellar spectrum and the emissions spectra is a critical point in the algorithm of the gaseous vertical profiles retrieval. Recently we developed a new method to extract UV emissions independently on gaseous absorption features. The method is based on instrumental characteristics only. It uses a multi-iterative Richardson-Lucy deconvolution algorithm and simultaneously performs deconvolution of the stellar spectrum. As a result the retrieved gaseous concentration profiles appeared to be more stable with the reducing $\chi 2$ (least-squared) value by 10-40 %.
One of the calibrations that influences on the retrieval process is determination of a wavelength-pixel assignment. There are various approaches leading to slightly different results. One of them is based on the observation of $CO_2$ absorption feature. However, the $CO_2$ band of the dense atmosphere saturates rapidly during one occultation seance. The second one compares a measured star spectrum and one reference spectrum of this star. The best wavelength-pixel assignment is provided by a combination of these two approaches.
Co-authors from the Space research institute (IKI) acknowledge a support from the Ministry of Education and Science of Russian Federation grant 14.W03.31.0017.