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Ozone vertical distribution on Mars from SPICAM/MEX UV occultations

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We have achieved a four-year climatology of the ozone vertical distribution using SPICAM UV occultations. The UV channel measures spectra between 118 and 320 nm. The occultation technique is self-calibrated, since the spectra are normalised with the observed solar spectrum to acquire atmospheric transmissions. The transmission spectra are fitted with the Beer-Lambert law taking into account extinction by gaseous species (CO_2 and O_3) and aerosols. Aerosol extinction is modeled with the so-called alpha-model, providing access to the Ångström coefficient, which depends on the size of the aerosols. The vertical inversion uses the so-called onion-peeling method. The full UV occultation dataset gives access to a climatology of ozone vertical distribution and to the local time variations. We will present the global results and a comparison to the LMD Mars Global Climate Model. We will also focus on certain case studies, such as the 4D mapping of the southern polar vortex. The climatology confirms the overall behaviour of ozone, but reveals some discrepancies in comparison with a global climate model. The transport-driven ozone layer within the southern polar vortex can be studied in detail with stellar occultations probing the polar night and solar occultations acquired at the edge of the vortex, revealing the overall behaviour of the ozone layer.

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