

The nitric oxide Venus night airglow: SPICAV observations and implications on transport in the lower thermosphere

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Spatially resolved spectra of the NO γ and δ ultraviolet bands on the Venus night side have been obtained from 80 to 130 km with the SPICAV instrument on board Venus Express. This emission results from radiative recombination of oxygen and nitrogen atoms created by photodissociation of CO₂ and N₂ molecules on the dayside and transported to the nightside by the subsolar to antisolar global circulation. The brightness of this emission varies by nearly two orders of magnitude and the average altitude of the peak emission is found to be 110 ± 5.4 km.

The full set of nightside limb profiles currently available has been deconvolved for the finite instrumental field of view and Abel inversion has been applied to derive the distribution of the volume emission rate. The latitudinal and local time distribution will be compared with a global NO airglow map constructed with SPICAV nadir measurements .

The characteristics of the NO airglow and their implications on global circulation and vertical transport on the nightside will be discussed. One- and two-dimensional models of the O and N distributions will be presented and compared with the observations.