Geophysical Research Abstracts
Vol. 19, EGU2017-10793, 2017
EGU General Assembly 2017

New non-LTE model of OH(v) in the mesopshere/lower thermosphere

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We present a new detailed non-LTE model of OH(v) for the nighttime mesosphere/lower thermosphere. The model accounts for chemical production of vibrationally excited OH and for various vibrational-vibrational (VV) and vibrational-translational (VT) energy exchanges with main atmospheric constituents. The new feature was added to account for the "indirect" vibrational-electronic (VE) mechanism OH(v)→O(^{1}D)→N_2(v) of the OH vibrational energy transfer to N_2, recently suggested by Sharma et al. [2015] and confirmed through laboratory studies by Kalogerakis et al. [2016]. We study the impact of this mechanism on the OH(v) populations and emissions in the two SABER channels at 1.6 and 2.0 μm. We also discuss the implications this mechanism will have on the retrieval of OH and O densities, as well as its effects on the nighttime CO_2 density retrievals from the SABER 4.3 μm channel.