

Long-term variation of OH peak emission altitude and volume emission rate over Indian low latitudes

M. SIVAKANDAN¹, T.K. RAMKUMAR¹, A.TAORI², VENKATESWARA RAO³, and K. NIRANJAN⁴

¹ *National Atmospheric Research Laboratory, Gadanki 517112, India*

² *National Remote Sensing Center, Hyderabad, 500037*

³ *Government College (Autonomous), Rajahmundry 533105, India*

⁴ *Department of Physics, Andhra University, Visakhapatnam 530003, India*

Using 13 (April 2002–December 2014) years of Sounding of the Atmosphere using Broad band Emission Radiometry (SABER/TIMED) 1.6 μm OH airglow emission data, we have studied the long-term variation of OH peak emission altitude and volume emission rate (VER) for 0–10°N latitude and 70–90°E longitude grid. We have noted that, during day time the OH peak emission altitude is varying from 80 to 87km with mean value of 83.5km and from 82 to 88km with mean value of 85km during nighttime. The signature of semi-annual oscillation (SAO), annual oscillation (AO) and quasi-biennial oscillation (QBO) in the OH peak emission altitude as well as the VER is evident. Our analysis reveals that the SAO and QBO signatures but not the AO signature are very strong in the equatorial region during nighttime. Apart from the SAO, AO and QBO signatures, the presence of oscillation related to the El Niño oscillation (ENSO) is also noted. After the removal of these oscillations, we find the evidence of the influence of solar activity and along term trend in the OH emission layer. It is also found good correlation between the mesospheric and stratospheric variations (ECMWF data).

Key words: OH emission, Oscillations, SAO, QBO