



Lidar observation of thermosphere sodium layers at Andes Lidar Observatory (30.25 S, 70.74 W)

Chao Ban (1,2), Alan Liu (2), Tao Li (1), Yafang Guo (2), Xiankang Dou (1), and Xianghui Xue (1)

(1) CAS Key Laboratory of Geospace Environment, School of Earth and Space Sciences, University of Science and Technology of China, Hefei, Anhui, China, (2) Center for Space and Atmospheric Research, Department of Physical Science, Embry-Riddle Aeronautical University, Daytona Beach, FL, USA

The Andes Lidar Observatory (ALO) sodium temperature/wind lidar observed thermosphere sodium layers (TSL) during 6 of the 13 nights of lidar observations between April 15 and 29, 2015. All these TSLs occurred at similar time and altitude (first occurred near 160 km around 0300 UT) and exhibited a downward phase progression which has the same trend as the semidiurnal tides. Especially, between April 17 and 23, TSLs occurred on 5 of the 6 lidar observation nights. Strong equatorial fountain effect was also observed during this period with medium magnetic activity (which may influence the strength of fountain effect). After verifying that the lidar observed winds are similar to the TIEGCM model neutral wind, we used the model neutral wind (zonal/meridional wind) to examine the effect of wind shear on the formation of TSL. The results suggest that the appearance of TSLs cannot be explained by the vertical drift convergence of ions/electrons due to horizontal wind shear. Other mechanisms need to be considered to explain the formation of TSL.