



The MLT over Fort Collins, Colorado (41N, 105W) as seen by SABER and lidar

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The SABER instrument on board the TIMED Satellite is a limb scanning infrared radiometer designed to measure temperature and minor constituent vertical profiles and energetic parameters in the mesosphere and lower thermosphere (MLT). The measurements have been performed continuously since January 25, 2002, providing excellent global coverage. The Colorado State University (CSU) narrow-band sodium (Na) lidar is located at Fort Collins, Colorado (41N, 105W). The lidar has been in operation since 1990 and since 2002 it routinely provides both night- and daytime observations between 80 and 110 km.

We have searched the SABER and lidar datasets for coincidental common volume measurements within ± 1 degree in latitude, ± 2 degrees in longitude and ± 10 minutes in time for the sake of comparison of measured temperatures, validation of the models used in SABER data analysis, and extracting new information about MLT parameters. We applied the non-LTE research code ALI-ARMS consistent with new SABER v1.07 operational algorithm to the analysis of measurements that satisfied these search criteria.

The results of this analysis demonstrate a good agreement between the lidar and the SABER temperature measurements, help to estimate the value of CO₂-O quenching rate, and verify the CO₂ climatology data used in the SABER nighttime temperature retrievals.