Abstract Submitted
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Harmonic analysis of mid-latitude temperatures in the mesopause region: TIME-GCM results and sodium resonance lidar observations during 2009[1] ALYNNE CUTLER, MAURA HAGAN, Utah State University, TITUS YUAN, Utah State University, Center for Atmospheric and Space Science — Analyses of sodium resonance lidar temperature measurements made during a three-day period in August 2009 in the mesopause region (ca. 70-120km) above Fort Collins CO, along with analyses of correlative temperature predictions from the Thermosphere-Ionosphere-Mesosphere-Electrodynamics General Circulation Model (TIME-GCM) reveal diurnal and semidiurnal temperature variations characteristic of solar atmospheric tides. Harmonic analyses via Fourier decomposition of the lidar data reveal a dominant semidiurnal oscillation with amplitudes that are well-represented in TIME-GCM at altitudes below about 92 km. A comparatively weaker diurnal tide was detected in the lidar data. This variation is negligible in the TIME-GCM results below 95km. Downward phase progression associated with upward propagating tides characterizes both tidal model and measurement results. Comparisons between August 2009 mean temperature profiles reveal a cold bias of ˜17K in the TIME-GCM mesopause region. Equivalent analyses of temperature during a second three-day period in January 2009 remain in progress.

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