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ICESTAR OBSERVATIONS OF THE SEMIDIURNAL TIDE AT SOUTHERN POLAR LATITUDES WITH SABER AND MESOSPHERIC RADARS

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We examine the semidiurnal tide in temperature using the SABER instrument aboard the TIMED satellite, while making ground-based measurements using mesospheric radars. Correlative analysis is carried out with the MF radar at Rothera, Antarctica, and the extensive network of MF and meteor radars at similar latitudes. The radars make high time resolution observations of the winds over heights of ~70–90 km. SABER can measure temperatures over a height range of ~30-100 km. SABER can only accurately resolve the semidiurnal tide over a yaw cycle (~60 days). Therefore, our study focuses on the static structure of the tide, in terms of phase/amplitude, and relative importance of the different wavenumber components. However, the more than four years of SABER data now available allow us to make a preliminary study of the temporal variability on seasonal and interannual timescales. The vertical phase structure of the migrating (westward zonal wavenumber 2) semidiurnal tide shows a strong discontinuity at stratopause heights that may be due to ozone. We investigate the influence of ozone and other factors on the structure and variability of the semidiurnal tide.