EGU22-10996, updated on 16 Aug 2022
https://doi.org/10.5194/egusphere-egu22-10996
EGU General Assembly 2022

Enhanced Quasi-6-Day Wave during the 2019 Southern Hemisphere SSW and its modulation of diurnal tides and gravity waves

Zishun Qiao[1,2], Alan Z. Liu[1], Nick Pedatella[2], Gunter Stober[3], Iain Reid[4,5], Javier Fuentes[6], and Chris Adami[4]

[1]Center for Space and Atmospheric Research and Department of Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, Florida, USA

[2]High Altitude Observatory, National Center for Atmospheric Research, Boulder, Colorado, USA

[3]Institute of Applied Physics & Oeschger Center for Climate Change Research, Microwave Physics, University of Bern, Bern, Switzerland

[4]ATRAD Pty Ltd., Thebarton, South Australia, Australia

[5]School of Physical Sciences, University of Adelaide, Adelaide, South Australia, Australia

[6]Gemini Observatory Southern Operations Center, Av. Juan Cisternas 1500, c/o AURA casilla 603, La Serena, Chile

A newly established multi-static meteor radar network, CONDOR (31.2ºS,70.0ºW), provides the capability to resolve wind and temperature oscillations over a broad range of periods, calculate E-P flux of planetary waves and investigate the short-term variability in the 80-100 km MLT region. In this study we present results of an enhanced westward wavenumber 1 Q6DW activity and its modulation with the amplified diurnal tides and gravity waves (GW) meridional wind variance during a rare minor SH SSW in 2019, using two SH midlatitude meteor radar observations and a recently developed 3DVAR algorithm. This algorithm creates a tomographic reconstruction of the 3D wind field based on optimal estimation technique and Bayesian statistics and is particularly suitable for investigating GW dynamics on regional scales. Furthermore, we present the first results of meteor radar observed Q6DW E-P flux and its comparison with SD-WACCM-X simulated Q6DW E-P flux. The encouraging agreement demonstrated that this SSW-related Q6DW activity had a significant impact on the dynamically coupled MLT region at SH midlatitude.