[EE] Evening Poster | P (Space and Planetary Sciences) | P-EM Solar-Terrestrial Sciences, Space Electromagnetism & Space Environment

[P-EM10]Coupling Processes in the Atmosphere-Ionosphere System

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Vertical coupling mechanisms throughout the whole atmosphere are critical to understanding the near Earth space environment, as well as its sensitivity to the solar, geomagnetic, and atmospheric drivers. This international session focuses on physical/chemical processes occurring in the mesosphere, thermosphere, and ionosphere (MTI) from both the poles to the equatorial region. Both quiet and disturbed states in response to lower atmospheric forcing or solar forcing are important for understanding the MTI system and its coupling to other regions. We invite presentations of observations and observational concepts with ground-based and/or space-borne instruments, theoretical studies, numerical simulations, and development of data analysis systems for various kinds of temporal and spatial variations in MTI system.

[PEM10-P02]Kelvin waves in the stratosphere and the MLT region during 2009-2010

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This study investigated slow Kelvin waves (SKWs) in the stratosphere and ultra-fast Kelvin waves (UFKWs) in the mesosphere and lower thermosphere (MLT) region during the strong El Niño period, 2009-2010. Some studies indicated that strong convection during El Niño may inspire more SKWs activities in the stratosphere. On the other hand, the variation of UFKWs in the MLT region during El Niño is still not clear. Therefore, this study compared SKWs in the stratosphere and UFKWs in the MLT region to get more detail about Kelvin wave’s upward propagation. To extract wave's properties, temperatures from TIMED/SABER (Thermosphere Ionosphere Mesosphere Energetics Dynamics/Sounding of the Atmosphere using Broadband Emission Radiometry) observations and ECMWF (European Centre for Medium-Range Weather Forecasts) reanalysis during 2009-2010 were used. Temperatures between -10 and +10 latitudes were firstly gridded into the day-altitude-longitude data cube, and then removed its background to get equatorial temperature fluctuations. For each altitude, the two-dimensional FFT was applied to each 96-day data segment and stepped forward in time by 1 day. Fourier spectra, the output of FFT, were analyzed to get primary wave periods and amplitude variation. The results show that UFKWs dominate the MLT region but SKWs dominate the stratosphere. SKWs show large amplitude in the quasi-biennal oscillation (QBO) easterly phase. However, UFKWs are not so active as SKWs in the same period. It seems that strong El Niño does not inspire more UFKWs activities in the MLT region.