

Ionospheric Effects of Strong El Niño Southern Oscillation Conditions

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The occurrence of a very strong positive phase in the El Niño Southern Oscillation (ENSO) in late 2015 has had effects on weather around the entire planet. Furthermore, recent investigations show that ENSO-related changes in tropospheric water vapor and rainfall drive significant changes in the temperature and wind structure in the middle atmosphere, through the modification of the spectrum of atmospheric tides. Given that several components of the tidal spectrum can propagate into the thermosphere, ENSO-related changes at altitudes above the mesopause and into the ionosphere may be expected. Based upon historical events in 1997 and 1998, we will show the ionospheric and thermospheric variations one may expect for El Niño and La Niña conditions. We will also show middle atmosphere conditions measured by the NASA TIMED SABER instrument for the 2015-2016 event. These efforts are enabled in part by modeling capabilities developed for the upcoming NASA Ionospheric Connection Explorer mission.

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