

Tsunamigenic ionospheric hole

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Co-/post-seismic ionospheric disturbances originated from acoustic-gravity waves triggered by epicentral ground/sea surface motion and by Rayleigh-waves traveling as well as 4-minutes monotonic atmospheric resonances have been observed in large earthquakes. In addition, growing giant tsunamis produce ionospheric holes after megathrust earthquakes occur along subduction zones. The tsunamigenic ionospheric hole, which is that plasma widely depresses in the hundred kilometer scale and recovers within tens of minutes, detected by ionospheric total electron content (TEC) measurement with Global Position System (GPS) is found on M9.0 2011 off the Pacific coast of Tohoku, M9.4 2004 M9.1 Sumatra and M8.8 2009 Chile earthquakes. This occurs because meter-scale down-welling of sea surface level surrounding first wave-front of tsunami wave yields hundred-kilometer-scale ionospheric plasma down-welling and recombination of plasma.