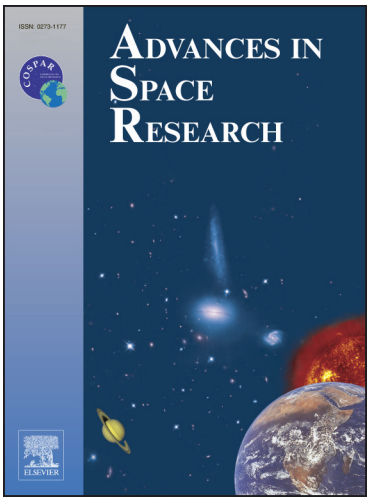

Seismogenic ionospheric anomalies associated with the strong Indonesian earthquake occurred on 11 April 2012 (M= 8.5)

Uma Pandey, Ashutosh K. Singh, Sanjay Kumar, A.K. Singh

PII: S0273-1177(17)30898-0
DOI: https://doi.org/10.1016/j.asr.2017.12.022
Reference: JASR 13555

To appear in: *Advances in Space Research*

Received Date: 11 September 2017
Revised Date: 13 December 2017
Accepted Date: 15 December 2017

Please cite this article as: Pandey, U., Singh, A.K., Kumar, S., Singh, A.K., Seismogenic ionospheric anomalies associated with the strong Indonesian earthquake occurred on 11 April 2012 (M= 8.5), *Advances in Space Research* (2017), doi: https://doi.org/10.1016/j.asr.2017.12.022

Seismogenic ionospheric anomalies associated with the strong Indonesian earthquake occurred on 11 April 2012 (M= 8.5)

Uma Pandey[1], Ashutosh K. Singh[1,2], Sanjay Kumar[1], A.K. Singh[1,*]

[1]Department of Physics, Banaras Hindu University, Varanasi, India.
[2]Department of Physical Sciences, Shri Ramswaroop Memorial University, Lucknow-Dewa Road, India.

Abstract:

Ionospheric perturbations in possible association with a major earthquake (EQ) (M = 8.5) which occurred in India-Oceania region are investigated by monitoring subionospheric propagation of VLF signals transmitted from the NWC transmitter (F = 19.8 kHz), Australia to a receiving station at Varanasi (geographic lat. 25.3° N, long 82.99° E), India. The EQ occurred on 11 April 2012 at 08:38:35 h UT (magnitude ≈ 8.5, depth = 10 km, and lat. = 2.3^{o}N, long. = 93.0^{o}E). A significant increase of few days before the EQ has been observed by using the nighttime amplitude fluctuation method (fixed frequency transmitter signal). The analysis of total electron contents (TEC) derived from the global positioning system (GPS) at three different stations namely, Hyderabad (latitude 17.38 °N, longitude 78. 48 °E), Singapore (latitude 1.37 ° N, longitude 103.84 ° E) and Port Blair (latitude 11.62° N, longitude 92.72° E) due to this EQ has also been presented. Significant perturbation in TEC data (enhancements and depletion) is noted before and after the main shock of the EQ. The possible mechanisms behind these perturbations due to EQ have also been discussed.

Keywords: Earthquake (EQ); Seismo-electromagnetics; Very low frequency (VLF) waves; GPS; Total electron content (TEC).

[*]**Corresponding Author:**
Abhay Kumar Singh
Atmospheric Research Laboratory,
Department of Physics, Institute of Science,
Banaras Hindu University, Varanasi, India
Email: singhak@bhu.ac.in
Phone: Mob: +91-9415303722