

GPS observation of periodic TEC variations following the 26 December 2004 Sumatra-Andaman earthquake

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In the period of five hours after the Mw9.3 Sumatra earthquake on 26 December 2004, we found the variations of the total electron content (TEC) by using the GPS observation. These variations can be separated into two parts. The first part started after ten minutes of the earthquake occurrence (00:58 UT), and continued for about one hour. The TEC variations during this first part had non-periodicity with extreme disturbance and propagated from the epicenter in the velocity of about 400 m/s. In the second part, which was started one hour later the earthquake occurrence, clear periodic TEC variations were detected. They continued for about two hours. 30 cycles of four minutes period variations were observed by the Phuket GPS receiver. It was also found that the periodic TEC variations were appeared only in a limited area. The area was in the southern part of Andaman Sea nearby Phuket Island, where is about 500 km away from the epicenter. The variations were observed by a few of GPS stations in the northern Sumatra (SAMP) and Thailand (PHKT and BNKK). No periodic TEC variation was observed in the region of India (DGAR, IISC and HYDE), the Coco Island (COCO), Australia (KARR, YARR and YAR2), the Philippines (PIMO and KAYT) and also the northern part of Thailand (SIS2 and CHMI). The characteristics of these TEC variations, which had clear four minutes periodicity, and started one hour after the earthquake, will be discussed in the presentation.