



## **Occurrence characteristics of ionospheric scintillation over the South East Asian region during the Solar cycle 24**

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For the purpose of studying the occurrence characteristics of the ionospheric scintillation over the region of South East Asia, data from seven stations in this area have been used, including four IGS stations: cusv (Thailand), ntus (Singapore), bako (Indonesia), xmis (Australia) and three continuously operating GPS receivers located in Vietnam: Phuthuy (in Hanoi, the north of Vietnam), Hue (the middle of Vietnam), Hocmon – Baclieu (in Ho Chi Minh city, the south of Vietnam). In this study, we use the S4 index obtained from the three GPS receivers located in Vietnam and the ROTI index computed at all seven stations to detect the occurrence of ionospheric irregularities. The time variation (daily, seasonally and yearly) and directional variation of scintillation appearances at each station were considered. Also, the S4 heat map over Vietnam region in 2015 has been produced. These results show that the ionospheric scintillation over the research area mainly occurs at night time, from 20 to 24- hour local time. For the seasonal variations, ionospheric scintillation always occurs more frequent on the equinoctial months and less significant on the solstitial months. Annual variation trend of scintillation occurrence has a good agreement with the solar cycle activity, with maximum occurrence in the years 2013, 2014 and the minimum occurrence in the years 2008, 2009. In general, ionospheric scintillation mostly focuses around the position of the crests of the Equatorial Ionization Anomaly (EIA), that is between 130 and 210 in the northern hemisphere and between -80 and 00 in the southern hemisphere. From the distribution maps of scintillation by direction and elevation, it can be seen that its positions often direct toward the closer anomaly crest.