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A statistical study on seismo-ionospheric precursors in the total electron content of global ionosphere map associated with M≥6.0 earthquakes in the West Pacific region during 1998–2012

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This paper reports statistical results of seismo-ionospheric precursors (SIPs) of the total electron content (TEC) in the global ionosphere map (GIM) over the epicenter of earthquakes with magnitude 6 and greater in China, Japan, and Taiwan during 1998-2012. To detect SIP, a quartile-based (i.e. median-based) process is performed. The earthquakes are sub-divided into various regions to have a better understanding on SIP characteristics, as well as examined with and without being led by magnetic storms to confirm the SIP existence. Results show that the SIPs mainly are the TEC significant increase in Japan, and decrease in Taiwan and China, respectively, which suggests the latitudinal effect playing an important role. Meanwhile, for a practical application of monitoring SIPs, the GIM TEC at a fixed point is tested. Results show that multi monitoring points and/or a spatial observation are required to enhance the SIP detection.