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Classification of ionospheric storm at the sub-equatorial ionization anomaly (SEIA) area in the East Asian region

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An classification of ionospheric storm effects in the sub-equatorial ionization anomaly(SEIA) region at 120˚E has been performed through the analysis of ionogram data at two ionosonde stations, Wuhan (114.4˚, 30.5˚) and Chung-Li (121.2˚, 25˚), and total electron content (TEC) derived from GPS network distributed around 120˚E. Three types of negative phase are identified. One is shown to be varied in phase of F-layer height variation and the other two out of phase. Three types of positive phase are also found. The mechanisms to cause these types of ionospheric effects has been considered to related with storm meridional thermospheric wind including traveling atmosphere disturbance(TAD), electric fields and composition changes. It is shown that the distortion of EIA under the effects of the above factors have significant influence on the behavior of SEIA ionogram parameters.