

Possible meteorological effects in the ionosphere associated with cold wave over Wuhan, China

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It is clear that meteorological activity, such as thunderstorm, cold front, hurricane and etc., can affect ionospheric variability, and its mechanism is an important problem to be solved. To understand the troposphere-ionosphere coupling well, more case studies are necessary. Meteorological effects in the ionosphere over Wuhan (geographic 114.4°E, 30.6°N; 45.2°dip), China, when cold wave passed during the interval 1957-1999, have been analyzed by superimposed epoch method. Statistical test has also been applied to the analysis. The results show that when cold wave passes, pronounced decreases of radio wave absorption (evaluated by f_{min}) and frequency of E layer (f_oE) are observed in day time (0800-1700LT), while in night time (2000-0500LT) sporadic E tends to occur more frequently and with higher critical frequency, f_bE_s , f_oE_s and the frequency of E_s occurrence increase obviously, and other ionospheric parameters have no distinct variance. We suggest that dynamic processes associated with acoustic gravity wave and wind shear are responsible for the effects. The result might be helpful for better understanding the coupling process of troposphere-ionosphere.