



Thunderstorm related variations of the ionospheric sporadic E layer over Rome

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Meteorological events in the lower atmosphere can affect the ionosphere by electromagnetic and mechanical processes. One type of the latter ones is the internal atmospheric gravity waves (AGWs) which can often be generated by thunderstorms. According to a Superposed Epoch Analyses (SEA) using the time series of the critical frequency (foEs) and virtual height (h'Es) of the sporadic E layer and WWLLN (World Wide Lightning Location Network) lightning data over the ionospheric station of Rome (41.9° 12.5°) there is a statistically significant decrease in the foEs of the sporadic E layer after the time of the lightnings. This may indicate a sudden decrease in the electron density of the sporadic E layer associated to lightnings. In order to understand the physical explanation for this phenomenon further studies are performed as follows: a SEA for different seasons and for daytime – nighttime lightnings separately. Direction of arrival of thunderstorms is also taken into account.