Regional peculiarities of the relationships between tropopause, upper atmosphere characteristics and thunderstorms

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Remote sensing techniques from the ground are sources of important information about the physical processes in the atmosphere and the events in the whole layer from the upper troposphere to the middle stratosphere. The tropopause region is associated with large gradients of various atmospheric parameters and influences considerably the dynamics of both troposphere and stratosphere. The upper atmosphere behavior exhibits some specificities. The thunderstorms play important role in the atmospheric water cycle, the atmospheric composition changes, the climate system, the stratospheric ozone loss and has influence on the ionosphere. There are some interrelationships between the different layers.

Ten years rocket measurement results over Akhtopol-Bulgaria have been discussed. Combined radar and other remote sensing are used for the monitoring of the dynamic characteristics of the region including the tropopause. Such observations over different spatial scales are expected to provide better understanding of the processes over the area. Results from combined different kind of remote sensing observations of upper atmosphere have been analyzed to clarify its peculiarities, the ozone behavior, thunderclouds characteristics and the potential transport across the studied atmospheric layers over Bulgaria.