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Radiation enhancements at Lomnický peak during thunderstorms

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A simultaneous measurement of secondary cosmic rays (CRs) by the detector system SEVAN (Space Environmental Viewing and Analysis Network) and of atmospheric electric field by EFM100 sensor at high mountain peak, Lomnický štít, altitude 2634 m asl, is presented. More than 20 events of count rate increases in the first SEVAN channel (ch1 is sensitive to charged particles and gamma-ray photons with energies approximately larger than 4 MeV) were identified during thunderstorms from June to September 2017 at time periods when the local electric field reached large absolute values (around 100 kV/m). Examples of these events are presented and discussed. It is shown that the increases of count rates in the ch1 were usually observed for several minutes and mostly did not exceed 10% of the background level. However, two events with more than 100% enhancement were observed. A majority, about 85% of the events, occurred during large negative electric field values, whereas only about 15% of the events were observed for positive electric fields (electric field is considered positive if the atmosphere above the sensor is positively charged with respect to the ground). The increases of count rates did not correlate with nearby lightning.