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Investigate ionizing radiation in the troposphere using ground-based neutron monitor, ACE/DSCVR satellite and RBSP satellite data for aviation radiation forecasting.

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The aviation altitude is continuously bombarded with high-energy ionizing cosmic radiation. The two main sources of ionizing radiation at the aviation altitude are the omnipresent background galactic cosmic rays which originate from outside our solar system and the transient solar energetic particle events which are associated with space weather events such as solar flares and coronal mass ejections. The passengers and aircraft crew are exposed to high-energy ionizing cosmic radiation during the flight. In this work, we will investigate the correlation between Neutron Monitor counts rates and solar wind speed and proton density from the Advanced Composition Explorer (ACE) satellite, as well as Neutron Monitor count rates and radiation belt density from the Radiation Belt Storm Probes (RBSP) satellites, during the coronal mass ejection (CME) events and quiet time. If the correlation exists, then it may be possible to use Neutron Monitor data in the future for the forecast the timing and level of ionizing radiation in the troposphere.

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