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Numerical modeling of the TLE-related particle precipitations due to wave-particle interactions in the magnetosphere

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It's well known that high energy particles precipitate into the ionosphere caused by interactions between lightning generated whistler waves in the atmosphere and the energetic particles in the magnetosphere. Perturbation of the lower ionosphere due to the precipitating particles are monitored by the ground-based VLF measurement as a space trimpi event.In this study, the spatio-temporal dependence of precipitating particle energy flux were calculated by numerical simulations. In particular, we focus on the source spectrum of lightning discharges as one of the simulation inputs. The results from different types of source spectra such as TLE-producing and conventional discharges will be presented.