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Spatial Precipitation Patterns of Energetic Particles

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Energetic particle precipitation at high latitudes originates in two sources: solar energetic particles and magnetospheric particles. POES MEPED data measured at high latitudes are compared with particle data obtained in interplanetary space and with geomagnetic indices. Important results include: (a) particle precipitation strongly depends on local magnetic time, (b) the ratio between energetic particles precipitating inside the auroral oval and inside the polar cap is highly variable with energy, geomagnetic activity and level of the flux of solar energetic particles, and (c) the spatial precipitation pattern moves equatorwards with increasing geomagnetic activity. Our results are tentatively interpreted in term as the energetic magnetospheric articles being the high-energetic end of the Birkeland currents. Consequences of our results for the modeling of atmospheric processes, such as ozone depletion or the occurrence of noctilucent clouds also will be sketched.