Relation of the relativistic electron dynamics on the geosynchronous orbit with high latitude magnetic activity

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Dynamics of relativistic electron fluxes on the geosynchronous orbit are considered as complex function of PC, Kp, Ap, and Dst indices of geomagnetic activity. We consider only maximal electron fluxes observed by GOES-8 on the dayside magnetosphere in 1997-2000. The fluxes vary with time significantly (up to 6th orders of magnitude) with average value is about 200 (s cm2)-1 and upper RMSD is about 1500 (s cm^2)^-1. The multiparametric linear regression, crosscorrelation and running averaging analysis is performed to search for relationship between geomagnetic indices and the enhancements of electron fluxes. It is obtained that the best correlation (0.43) is achieved for 3-hour Ap-index and 1 hour PC-index that were shifted on 68 hours, and 2 day averaged PC-index observed before the relativistic electron enhancements. Such delay in the relativistic electron flux response on the auroral and polar geomagnetic indices together with cumulative effect of magnetosphere energy accumulation indicate that relativistic electrons are accelerated gradually in the outer magnetosphere.