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Modelling electron fluxes and the evolution of phase space density profiles under the effect of ULF pulsations

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The inner edge of the outer radiation belt electrons and the innermost plasmapause location (Lpp) are well correlated. This correlation suggests that the depth to which the outer radiation belt electrons can penetrate into the inner magnetosphere is closely tied to the innermost Lpp. Both proposed acceleration mechanisms, inward radial diffusion and in situ acceleration, are more effectively operating outside the plasmapause, and the relative contribution of each mechanism is the subject of current debates. In this presentation, we focus on quantifying the contribution of radial diffusion by tracing energetic electrons in a model of magnetospheric ULF fluctuations. Electron fluxes are constructed from ensembles of electrons traced under the effect of model field fluctuations both for quiet and for active times in terms of ULF fluctuation activity. Constructed fluxes are compared to geosynchronous flux measurements and diffusion rates are compared to the theoretically predicted radial diffusion coefficients. Fluxes are used to realisticaly approximate phase space density profiles, whose evolution is then monitored in time. We find that large amplitude ULF fluctuations during active times can produce significant electron transport and flux increases; this radial transport however cannot be described by theoretical approximations of radial diffusion.