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Weak Turbulence in Radiation Belts[1] GURUDAS GANGULI, CHRIS CRABTREE, Naval Research Laboratory, LEONID RUDAKOV, Icarus Research Inc — Weak turbulence plays a significant role in space plasma dynamics. Induced nonlinear scattering dominates the evolution in the low-beta isothermal radiation belt plasmas and affects the propagation characteristics of waves. As whistler waves propagate away from the earth they are scattered in the magnetosphere such that their trajectories are turned earthward where they are reflected back towards the magnetosphere. Repeated scattering and reflection of the whistlers establishes a cavity in which the wave energy can be maintained for a long duration with, on average, a smaller wave-normal angle. Consequently, the cyclotron resonance time for the trapped energetic electrons increases, leading to an enhanced pitch-angle scattering rate. Enhanced pitch-angle scattering lowers the lifetime of the energetic electron population. Also, pitch-angle scattering of the trapped population in the cavity with a loss cone distribution amplifies the whistler waves, which in turn promotes a more rapid precipitation through a positive feedback mechanism. Typical storm-pumped radiation belt parameters and laboratory experiments will be used to elucidate this phenomenon

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