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Radial Diffusion and Local Acceleration During October-November Storms 2003.

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Stochastic acceleration and loss of MeV electrons during October-November storms 2003 is required to explain the rapid loss and the formation of a new radiation belt in the “slot“ region. We present simulations of radial diffusion and local acceleration during the first days of November,2003. Radial diffusion driven by ULF waves can not explain the formation of the new radiation belt in the slot region and predicts a decay of fluxes in the recovery phase of the October 31st storm. The compression of plasmasphere during the main phase of the storm down to L=2 creates preferential conditions for local acceleration. Filling of the slot region of the radiation belts is modeled with a 2D pitch-angle, energy diffusion code. We show that the energy diffusion driven by whistler mode waves is capable of accelerating electrons up to energies of 3 MeV on the time scales of few days which is consistent with HEO and SAMPAX observations.