

# Parametrizations of the electron lifetimes

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The variability of the radiation belt relativistic electrons is due to a competition between various loss and source processes. Resonant wave-particle interactions may scatter electrons into the loss cone which results in the loss of particles from the system. The scattering rates due to whistler chorus and EMIC waves are computed using quasi-linear approximations. Thus computed diffusion rates are used in the pitch angle scattering code to determine the decay rates of the phase space density due to interactions with various plasma waves. We show that electron lifetimes are primarily determined by the scattering rates near the edge of the loss cone. In particular high latitude chorus waves and EMIC waves may provide dominant scattering of the particles into loss cone. We also present parameterizations of lifetime due to various plasma waves which can be used in particle tracing codes and ring current codes.