**Fractional resonance of sub-MeV electrons with oblique EMIC waves**  
  
D.S. Tonoian 1, X-J. Zhang 1,2 and A.V. Artemyev 2,3  
  
1. University of Texas at Dallas, USA  
2. University of California, Los Angeles, USA  
3. Space Research Institute, RAS, Moscow, Russia  
  
Relativistic electron losses in the outer radiation belt are largely attributed to electron resonant scattering by electromagnetic ion cyclotron (EMIC) waves. While quasi-linear theory predicts scattering of electrons of >1 MeV, sub-MeV electron precipitation is also present. Leaving aside an important and rapidly developing theories of nonlinear, nonresonant, and bounce-resonant EMIC wave interactions, we will discuss the effect of fractional resonances with oblique EMIC waves, which have minimum resonant energy twice lower than anomalous cyclotron resonance.