Abstract Submitted
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Towards a better understanding of high-energy electron pitch-angle scattering by electromagnetic ion cyclotron waves.[1] S VINCENA, W GEKELMAN, P. PRIBYL, S,W, TANG, UCLA, K. PAPADOPOULOS, U. Maryland — Shear Alfven waves are a fundamental mode in magnetized plasmas. Propagating near the ion cyclotron frequency, these waves are often termed electromagnetic ion cyclotron (EMIC) waves and can involve multiple ion species. Near the earth, for example, the wave may interact resonantly with oxygen ions at altitudes ranging from 1000 to 2000 km. The waves may either propagate from space towards the earth (possibly involving mode conversion), or be generated by RF transmitters on the ground. These preliminary experiments are motivated by theoretical predictions [1] that such waves can pitch-angle scatter relativistic electrons trapped in the earth's dipole field. EMIC waves are launched in the Large Plasma Device at UCLA's Basic Plasma Science Facility in plasmas with single and multiple ion species into magnetic field gradients where ion cyclotron resonance is satisfied. We report here on the frequency and k-spectra in the critical layer and how they compare with theoretical predictions in computing an effective diffusion coefficient for high-energy electrons. [1] B. Eliasson and K. Papadopoulos (in submission)

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