Abstract Submitted
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Scattering of Magnetic Mirror-trapped fast Electrons by an Alfvén Wave[1] YUHOU WANG, WALTER GEKELMAN, PATRICK PRIBYL, UCLA Dept of Physics, DENNIS PAPADOPOULOS, Univ of Maryland, Dept of Physics — Highly energetic electrons produced naturally or artificially can be trapped in the earth's radiation belts for months, posing a danger to satellites. A technique for artificially de-trapping these electrons is under investigation at the Large Plasma Device (LaPD) at UCLA. The experiment is performed in a quiescent afterglow plasma ($n_e = 0.1 - 1 \times 10^{18}/m^3$, $T_e \approx 0.5eV$, $B_0 = 400 - 1600G$, $L = 18m$, and $diameter = 0.6m$). A population of runaway electrons is generated by 2^{nd} harmonic ECRH (P=25kW, τ=10-50ms, f=2.45GHz), as evidenced by production of X-rays with energy up to 5MeV. The fast electrons are trapped in a magnetic mirror field (R_m=1.1-4). A shear Alfvén wave (f=110-230 kHz, B_{wave}=2G) is launched with a rotating magnetic field antenna. The Alfvén wave is observed to dramatically affect the trapped fast electrons and scatter them out of the mirror.

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Yuhou Wang
UCLA Dept of Physics

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