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Interaction of a Relativistic Electron Beam with Magnetized Plasma[1] SETH DORFMAN, University of California, Los Angeles, VADIM ROYTERSHTEYN, Space Science Institute, CYNTHIA CATTELL, University of Minnesota, BART VAN COMPERNOLLE, University of California, Los Angeles, GIAN LUCA DELZANNO, Los Alamos National Laboratory — The interaction between relativistic electron beams and a magnetized plasma is a fundamental and practical problem that is relevant to many challenging issues in space physics and astrophysics. For example, it is well known that energetic particles in the Earths radiation belts pose a danger to communication satellites. Compact electron beam sources may be used on future spacecraft to generate waves that would remove the energetic particles from the radiation belt region. A full understanding of the physics of these waves may also shed light on the mechanism for type II/III solar radio emissions. This talk will discuss experiments proposed to further advance understanding of the physical mechanisms governing beam-plasma interactions. The experiments and supporting simulations will investigate in detail the types of waves (whistler, Langmuir, etc.) produced by high-energy beams, beam stability, and feasibility for future space-based experiments. Experiments will be conducted on the Large Plasma Device (LAPD) at UCLA using a unique variable-energy electron beam recently developed at Los Alamos. We will discuss the proposed experimental setup as well as ongoing feasibility studies conducted using theoretical estimates and kinetic simulations.

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Seth Dorfman
University of California, Los Angeles

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