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The Effect of Self-Generated Magnetic Fields on Ablative Rayleigh–Taylor Instability Dynamics[1] FERNANDO GARCIA-RUBIO, RICCARDO BETTI, Laboratory for Laser Energetics Department of Mechanical Engineering. University of Rochester., HUSSEIN ALUIE, Department of Mechanical Engineering. University of Rochester. — Measurements of magnetic (B) field induced by the ablative Rayleigh–Taylor instability (ARTI) in laser-produced plasmas[2] indicate that it may play an important role in the dynamics of this instability. The B field modifies the thermal conduction, and the Righi–Leduc term can be destabilizing by moving heat away from the top of the spike toward the bubbles. [3,4] In this talk, we present an analysis of the linear stage of the ARTI with self-generated B fields. We identify an unstable mechanism arising from the interplay between the Biermann battery term that generates B field, which in turn affects the energy equation through the Righi–Leduc term. In essence, this mechanism is similar to the magnetothermal instability arising in the underdense corona.[5] At the ablation front, however, the coupling of this mechanism with the hydrodynamics needs to be self-consistently solved. We discuss the new dispersion relation derived.

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