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Convective stability of a magnetized plasma containing cosmic rays BENJAMIN CHANDRAN, Space Science Center, University of New Hampshire, TIMOTHY DENNIS, Dept. Physics and Astronomy, University of Iowa — Convection plays an important role in a variety of astrophysical settings, including stellar interiors, accretion flows, and the hot plasma between galaxies in galaxy clusters. As shown by S. Balbus (2000), magnetic fields powerfully affect the convective stability criterion in low-density plasmas by constraining heat to diffuse along magnetic field lines. In this poster, we extend Balbus' analysis by including cosmic rays, but restrict our focus to non-rotating plasmas. We derive the convective stability criterion, provide a physical description of stable and unstable modes, and discuss the implications of our work for convection in clusters of galaxies and the so-called "cooling-flow problem." The convective modes that we discuss are similar to the local Parker instability in the high-beta limit, except that we take into account anisotropic thermal conduction and allow the equilibrium to be non-isothermal.

Benjamin Chandran
Space Science Center, University of New Hampshire

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