



Daniel Eckhardt

Rensselaer Polytechnic Institute

Suppression of the Magneto-Rotational Instability

eckhad@rpi.edu

Magneto-rotational instability (MRI) is of great importance to astrophysics, as it is theorized to be the accretion driving phenomenon in accretion disks in astrophysical flows, for example, around black holes. Though MRI has long been known, it has yet to be observed at in laboratory experiments, partly due to the difficulty of creating the exact conditions in accretion disks. MRI can be studied by considering magnetized Taylor-Couette flow in a hydro-dynamically stable regime according to the Rayleigh criterion. However, it is shown here that MRI is in fact suppressed when the term representing the twisting of radial magnetic components into azimuthal ones is dropped, and that no other instabilities occur, even with Navier-slip and conducting boundary conditions, as opposed to no-slip and insulating boundaries.