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Modeling Radial Bernstein Modes in an Axisymmetric Finite Length Non-Neutral Plasma MARK HUTCHISON, BRYAN PETERSON, ROSS SPENCER, Brigham Young University — Non-neutral plasmas are often studied in plasma physics because they can be confined for relatively long periods of time when compared to confinement times of neutral plasmas. Primarily, research has been focused on modeling plasmas with textbook geometries such as slabs, infinite cylinders, and spheres. An important aspect of these models is to be able to predict and understand their normal modes. These modes carry vital information about the interior of the plasma and offer a variety of both nondestructive and destructive diagnostics. Unfortunately, traditional methods of trapping and monitoring plasmas can only offer measurements of axial density changes. Therefore, radial Bernstein modes are undetectable in long plasmas. On the other hand, short plasmas will significantly alter their axial density when a radial mode is excited. Modeling these modes in a finite length plasma and done in conjunction with experiment would be valuable in advancing our understanding of these modes and the information they carry. I will be presenting the method we are using to model these modes using a judicious change in variables that numerically works to our advantage.

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