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**Effect of FLR Nonlocality of Fast Ions on Tearing Mode Stability in the RFP**[1] V.V. MIRNOV, University of Wisconsin-Madison — Interaction of high-energy ions with the background plasma is a long-standing problem of fusion research. In tokamaks, the high energy component decouples due to the large banana width. In the RFP, the gyroradius is much larger than in a tokamak and FLR effects become dominant. Previously, the problem was treated semi-analytically by integrating along particle trajectories in a uniform magnetic field, and numerically using NIMROD, modified for full orbit kinetics. To benchmark these two approaches we develop an analytical model based on the asymptotic limit of large Larmor orbits. In this limit, the fast ion current is ignored. The bulk ion ExB current is compensated by the current of ExB drifting electrons. Due to plasma quasineutrality there is an uncompensated ExB electron current carried by the population of electrons with the density equal to the fast ion density. This current and the bulk ion polarization current lead to a system of differential equations where the effect of the high energy component is expressed locally in terms of the fast ion density. The boundary layer problem for tearing mode stability is treated analytically yielding the effect of high energy ions on the instability threshold.

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