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Kinetic effects in gyrokinetic tearing instability¹ RYUSUKE NU-MATA, WILLIAM DORLAND, University of Maryland, NUNO LOUREIRO, Technical University of Lisbon, BARRETT ROGERS, Dartmouth College, ALEXAN-DER SCHEKOCHIHIN, University of Oxford, TOMOYA TATSUNO, University of Maryland — We present numerical results of tearing instability simulations in a strong guide magnetic field limit using the AstroGK astrophysical gyrokinetics code. The tearing growth rates from the gyrokinetic simulations show quantitative discrepancy with those of the fluid model based on the compressible two-fluid MHD model [1], which may be ascribed to the treatment of pressure. In the kinetic model, the pressure tensor cannot be described one single relation to the density. Moreover, the behavior of the pressure can be very different in the inner current layer and the outer ideal MHD region. In this presentation, we show results of pressure tensor diagnostics, and discuss the effect of the pressure tensor on the linear tearing instability. Preliminary results from nonlinear simulations will also be presented.

[1] E. Ahedo and J.J. Ramos, Plasma Phys. Control. Fusion 51, 055018 (2009).

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> Ryusuke Numata University of Maryland

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