Electron temperature anisotropy effect on the tearing mode

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[1] none

Dependence of the tearing mode saturation level on the current sheet thickness is investigated by two-dimensional full particle simulations. It has been known that in a thicker current sheet, the growth rate and also the saturation level of the tearing mode becomes small. Tanaka et al.[2004] has determined the critical thickness above which the effects of the mode diminishes. Here we add temperature anisotropy (Tperpe / Tparae greater than 1) to the current sheet electrons and study its effect. It has been reported that the anisotropy enables large growth rates to be achieved at high wave numbers, but its effect in the non-linear stage is not necessarily clear. Our focus is on its effect in a current sheet thicker than the critical thickness. We have found that the electron anisotropy does activate the tearing mode even in the post-critical thickness range but that happens only when the system size is large so that elementary magnetic islands (wavelength ˜12D, D: half-thickness of the initial current sheet) are allowed to coalescence to a larger island. Results of the survey with various D, Tperpe / Tparae, and M (M: ion to electron mass ratio) will be reported.