

# P1.1039 Gyrokinetic theory of the nonlinear saturation of toroidal Alfvén eigenmode

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See the full abstract here:

<http://ocs.ciemat.es/EPS2019ABS/pdf/P1.1039.pdf>

Shear Alfvén wave instabilities such as toroidal Alfvén eigenmode (TAE) are expected to play important roles in magnetic confinement fusion devices as energetic particles (EPs) contribute significantly to the total power density. TAE can be driven unstable by EPs, and in turn, induce EP transport and degrade overall plasma confinement.

Nonlinear saturation of TAE via ion induced scatterings [1] is investigated in the shortwavelength gyrokinetic regime [2]. It is found that the nonlinear evolution depends on the thermal ion value. Here, is the plasma thermal to magnetic pressure ratio. Both the saturation levels and associated energetic-particle transport coefficients are derived and estimated correspondingly [3].

References

[1] Hahm T S and Chen L 1995 Phys. Rev. Lett. 74(2) 266-269

[2] Chen L and Zonca F 2013 Phys. Plasmas 20 055402

[3] Qiu Z, Chen L and Zonca F, "Gyrokinetic theory of the nonlinear saturation of toroidal Alfvén eigenmode" 2019 Nucl. Fusion submitted

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