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Global gyrokinetic multi-model simulations of ITG and Alfvenic modes for tokamaks and the first operational phase of Wendelstein 7-X

Tuesday 23 October 2018 14:00 (20 minutes)

Results from a hybrid approach (CKA-EUTERPE code) which couples an MHD code with a gyrokinetic code are presented. Although perturbative, it offers a relatively fast way to investigate the destabilisation of Alfven modes by fast particles. TAE saturation amplitudes and their scaling with growth rate and collisionality were investigated in a tokamak as well as in Wendelstein 7-X.
Full volume linear electrostatic gyrokinetic simulations for an OP 1.1 Wendelstein 7-X scenario showed modes driven by the strong electron temperature gradient with negligible influence from trapped particles.
Using a Fourier solver approach, long-time fully kinetic runs of damped GAEs and TAEs could be performed. Super-resolution methods allowed to accurately resolve the continuous Alfven spectrum.

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