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Validation and interpretation of 3D non-linear MHD disruption simulations with JOREK

Wednesday, 13 October 2021 11:40 (30 minutes)

This presentation will focus on recent progress towards the validation of 3D non-linear MHD disruption simulations with the JOREK code. Simulations of a disruption triggered by an argon massive gas injection in JET pulse 85943 have been compared in detail to experimental data. Synthetic diagnostics have been used for the purpose, including interferometry, bolometry and saddle loops. A good global match has been found for these diagnostics as well as for the evolution of the plasma current, including the characteristic spike, giving confidence in the model. Analysis of the simulations reveals that the drive of the $m=2/n=1$ tearing mode via radiative cooling inside the island is a key mechanism in the disruption process. This drive leads the 2/1 island to grow to a very large size, causing a relaxation all the way to the plasma center. Other cases, including with shattered pellet injection, will also be discussed.

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