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P1.1095 Studies of Alfvén eigenmodes on JET with both experimental measurements with the AEAD and modelling with GTC

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The resonant detection and measurement of the damping rates of Alfvén Eigenmodes (AEs) is of critical importance to the design of experiments and development of models of AE stability [1]. With the Alfvén Eigenmodes Active Diagnostic (AEAD) on JET, weakly-damped Toroidal AEs (TAEs) have been probed. Theoretical modeling using the Gyrokinetic Toroidal Code (GTC) has been made to simulate both stable and unstable TAEs, a good agreement was obtained between experiments and modeling [1]. With GTC we also identified and quantified modes' individual drive and damping mechanisms.
The AEAD has undergone a major upgrade with new amplifiers, filters and digital control system [2], which allow us to perform new study and damping rate measurements of low frequency modes such as GAMs, BAEs/BAAEs and RSAEs. These modes along with TAEs are expected to be probed during next JET isotope experiments and the DT campaign. Those new experimental results will be compared with modeling using state of the art MHD and gyrokinetic (GTC) codes. JET counts now more than twenty newly installed magnetic probes which will give more accuracy to the AEAD real-time detection system and our analyses. These will improve further predictions for next-step burning plasma, including ITER.

[1] V. Aslanyan et al., Nucl. Fusion 59, 026008 (2019).
[2] P. Puglia et al., Nucl. Fusion 56, 112020 (2016).
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*See the author list of "Overview of the JET preparation for Deuterium-Tritium Operation" by E. Joffrin et al., to be published in Nuclear Fusion Special issue for the 27th Fusion Energy Conference.

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