

Investigation of Alfvénic activity during the current quench in ASDEX-Upgrade

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During the current quench in ASDEX Upgrade (AUG) disruptions, created by massive gas injection (MGI) to study runaway electron (RE) physics [1], Alfvénic activity is visible in the 300-800 kHz range. An example is presented in figure 1. These modes are analysed as potential runaway electron mitigation candidates [2]. With the help of a mode tracing algorithm, we classified the mode behaviour for 180 discharges. We found these modes to be ubiquitous in shots which had the primary goal of RE generation. We performed a systematic statistical analysis using 38 selected parameters (describing pre- and post-disruption plasma, RE behaviour, mode behaviour, etc.) and found no significant effect of the mode characteristics on the formation of the subsequent RE beam [3]. Global Alfvén eigenmodes (GAEs) are investigated as the most likely candidates. Changes in the Alfvén continuum are proposed as a possible cause for the strong frequency sweeping of the observed modes.

[1] G. Pautasso et al., Nuclear Fusion 60, 086011 (2020).

[2] A. Lvovskiy et al., PPCF 60, 124003 (2018).

[3] P. Heinrich, MSc thesis (2021). <http://hdl.handle.net/21.11116/0000-0008-ED5A-9>

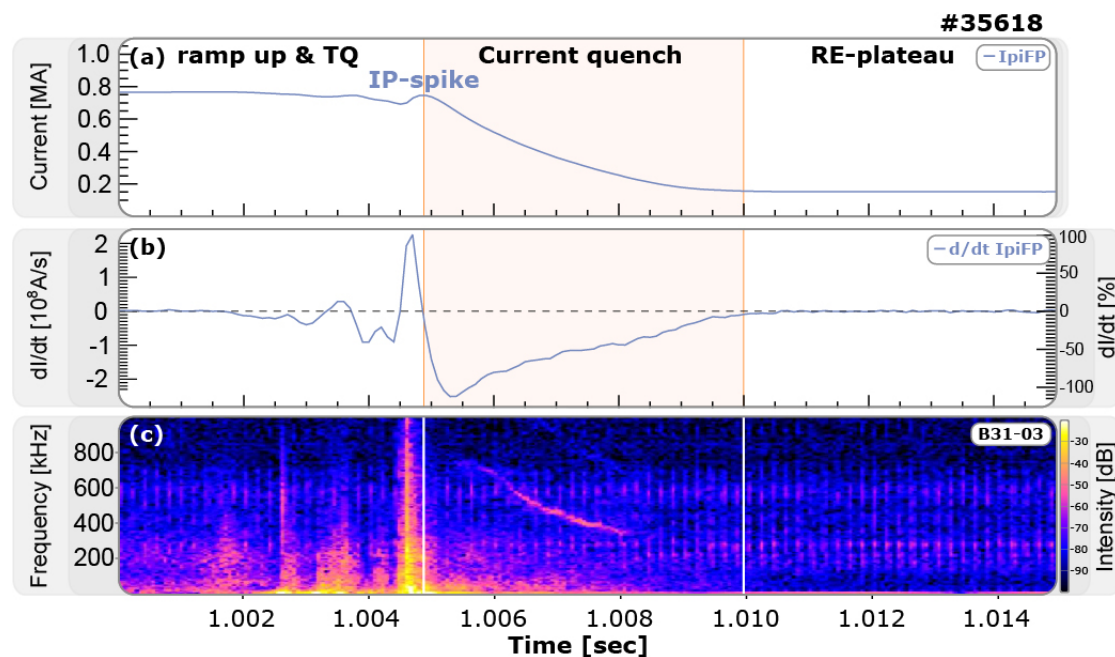


Figure 1: figure 1: Typical Alfvénic mode during a disruption in AUG.

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