

Abstract Submitted
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Interactions of Fast Ion Losses and MHD During an ELM Cycle¹

RYAN CHABAN, SASKIA MORDIJCK, William Mary Coll, DAVID PACE, General Atomics — This work focuses on empirically determining correlations between different types of MHD activity in the pedestal region in DIII-D H-modes and fast ion losses to guide future work on discovering the interaction mechanisms between these two phenomena. Using conditional averaging, data of the energetic ion energy-pitch angle distribution, pedestal measurements, and ELM crashes was analyzed to track fast ion and MHD development over the ELM cycle. Prior research has focused on understanding MHD precursors to ELMs and how these magnetic precursors, and separately energetic ion losses, grow before an ELM crash. Later, we observe that during the ELM crash, energetic ion losses occur at uncommon energy - pitch angle phase space. The fast ion losses that occur during the ELM crash have very high pitch angles and relatively low energy, implying a loss of confined ions that could not yet deposit their energy. After the ELM crash, when there is little MHD activity, there is also a lack of consistent fast ion losses, indicating that MHD activity at the plasma edge may enhance fast ion losses.

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