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Co-evolution of ITB and ELM dynamics in the high poloidal beta scenario[1] D.B. WEISBERG, A.M. GAROFALO, T.H. OSBORNE, G.M. STAEBLER, General Atomics, L. WANG, J. QIAN, X.Z. GONG, J. HUANG, ASIPP — The evolution of edge localized mode (ELM) dynamics in high poloidal beta discharges is found to correlate with changes to the internal transport barrier (ITB) common to this scenario. A large dataset of different types of DIII-D high poloidal beta discharges (spanning a wide range of q_{95}, B_T, I_P, and β_N trajectories) shows that weak ITB/strong pedestal equilibria tend to have large compound type-I ELMs with embedded high frequency type-II ELMs and extended ELM-free periods. This is in direct contrast to strong ITB/weak pedestal equilibria that tend to be free of large type-I ELMs and consist almost entirely of high frequency type-II ELMs. This coupling between the pedestal and the ITB supports previous studies [PoP 25, 056113] that describe the interplay between magnetic shear and the Shafranov shift parameter in determining the sizes of the two transport barriers. The evolution of ELM dynamics in these discharges is contrasted between different shot trajectories; both inductive (constant vs. decreasing q_{95}) and non-inductive (constant vs. decreasing B_T). Trends in ELM frequency and ELM-induced drops in stored plasma energy point to a possible operating point at lower edge collisionality that may correspond to decreased energy exhaust via grassy ELMs.

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