Abstract Submitted
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Limits of RMP ELM suppression in double null plasmas[1] MORGAN SHAFER, ORNL, CARLOS PAZ-SOLDAN, TODD EVANS, General Atomics, NATHANIEL FERARRO, PPPL, BRENDAN LYONS, THOMAS OSBORNE, ALAN TURNBULL, General Atomics — New DIII-D results provide a candidate explanation for why achieving ELM suppression by resonant magnetic fields (RMPs) remains elusive in double null (DN) diverted configurations: the lack of ELM suppression in DN correlates with a damped high-field side response of field-aligned structures that could be indicative of a missing resonant tearing needed to stop inward growth of pedestal. The lack of ELM suppression in DN is found despite matching favorable conditions for RMP suppression identified in lower single null (LSN). Here, low $\Omega_{E\times B}$ is aligned with a resonant surface at the pedestal top over a range of q_{95} from 3.4 to 4.1 with $n_{e,ped} < 2.5\times10^{19}m^{-3}$. The 3D plasma response measured on the high-field side (HFS) drops in plasma shapes transitioning from LSN to DN and recovers in upper single null (USN), while the low field side (LFS) response remains relatively constant from LSN to USN. The reduced HFS response is found across a range of $|dR_{sep}| < 1cm$ indicating it is not restricted to balanced DN. Linearized MHD modeling similarly shows a reduction in HFS response in double null configurations. Conceptually, the additional null adds radial shear to externally driven field-aligned modes on the LFS and may inhibit HFS coupling.

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