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Plasma Response in Single Null and Double Null Plasmas and Implications for ELM Suppression[1] MORGAN SHAFER, Oak Ridge National Laboratory, CARLOS PAZ-SOLDAN, TODD EVANS, BRENDAN LYONS, ALAN TURNBULL, DAVID WESIBERG, General Atomics, NATHANIEL FERRARO, Princeton Plasma Physics Laboratory — The 3D plasma response to applied non-axisymmetric magnetic fields decreases as the plasma shape transitions from single null to double null divertor configuration. Measurements from the DIII-D tokamak show the response measured on the high-field side (HFS) drops while remaining relatively constant on the low-field side (LFS) in both the external magnetics and internal SXR. The drop in the HFS response is shown over a range of $n_{e,ped}$, β_n, and q_{95} for both $n = 2$ and $n = 3$ perturbations indicating a robust effect. Linearized time-independent extended 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 therefore may inhibit the coupling to the HFS. This may provide a reason as to why RMP ELM suppression in double-null configurations has been elusivecoupling to the HFS plasma response has been previously correlated with ELM suppression.

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