Compatibility of RMP ELM Suppression with Radiating Diverter in DIII-D

T.W. PETRIE, N.H. BROOKS, T.E. EVANS, J.R. FERRON, T.C. LUCE, P.A. POLITZER, M.J. SCHAFFER, P.B. SNYDER, General Atomics, M.E. FENSTERMACHER, C.J. LASNIER, M.E. RENSINK, LLNL, B. HUDSON, ORISE, J.G. WATKINS, SNL, S. MORDIJC, UCSD — The integration of edge localized mode (ELM) suppression using resonant magnetic perturbations (RMPs) with radiating divertor operation is explored. Moreover, during ELM mitigation experiments, we find that radiating divertors with the RMP coils activated produce both higher levels of radiated power from the divertor and SOL/edge plasma regions (∼30% higher) and significant reductions in peak heat flux from ELMs at the divertor targets (∼30-40% lower) than comparable non-RMP H-mode discharges at the same density. These results build on the theoretical and experimental progress made previously in identifying the underlying physics involved in two distinct areas, i.e., puff-and-pump radiating divertor [1] and ELM suppression using RMPs [2].


Supported by the US DOE under DE-FC02-04ER54698, DE-AC52-07NA27344, DE-AC05-06OR23100, DE-AC04-94AL85000, DE-FG02-05ER54809 and DE-FG02-07ER54917.