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6.51 Imaging of Divertor Strike Point Splitting in RMP ELM Suppression Experiments

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Fast visible imaging of the lower divertor surface has been implemented to study the structure and dynamics of lobes induced by resonant magnetic perturbations (RMP) in ELM suppression experiments in DIII-D. The best compromise between amount of light and sharp imaging was obtained using emission at 601 nm that in ionizing plasmas is due to molecular deuterium emission from the Fulcher- α band. Multiple spatially resolved peaks in the D2 emission, taken as a proxy for the particle flux, are readily resolved during RMPs, in contrast to the heat flux measured by infrared cameras, which shows little spatial structure in ITER-like conditions. The 25 mm field lens provides high spatial resolution from the centerpost to the outer shelf over 50° toroidally that overlaps the field of view of the IRTV. The image is coupled to a Phantom 7.3 camera using a Schott wound fiber bundle, providing high temporal resolution that allows the lobe dynamics to be resolved between ELMs and across ELM suppression onset. These measurements are used to study the heat and particle flux in 3D magnetic fields, and to validate models for the plasma response to RMPs. *Work supported by U.S. DOE under DE-FG02-07ER54917, DE-FG02-05ER54809, DE-FC02-04ER54698, DE-AC52-07NA27344, DE-NA0003525, and DE-AC04-94AL85000.

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