Abstract Submitted
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Effect of 3-D magnetic fields on neutral particle fueling and exhaust in MAST[1] KURT FLESCH, THIERRY KREMEYER, IAN WATERS, OLIVER SCHMITZ, Univ of Wisconsin, Madison, ANDREW KIRK, JAMES HARRISON, Culham Centre for Fusion Energy — The application of resonant magnetic perturbations (RMPs) is used to suppress edge localized modes but causes in many cases a density pump-out. At MAST, this particle pump out was found to be connected to an amplifying MHD plasma response. An analysis is presented on past MAST discharges to understand the effect of these RMPs on the neutral household and on changes in neutral fueling and exhaust during the pump out. A global, 0-D particle balance model [G. Maddison et al. PP&CF 48 (2006) 71] was used to study the neutral dynamics and plasma confinement during shots with and without RMP application. Using the Dα emission measured by filterscopes and a calibrated 1-D CCD camera, as well as S/XB coefficients determined by the edge plasma parameters, globally averaged ion confinement times were calculated. In L-mode, discharges with RMPs that caused an MHD response had a 15-20% decrease in confinement time but an increase in total recycling flux. The application of RMPs in H-mode caused either a decrease or no change in confinement, like those in L-mode, depending on the configuration of the RMPs and plasma response. A spectroscopically assisted Penning gauge is being prepared for the next campaign at MAST-U to extend this particle balance to study impurity exhaust with RMPs.

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Kurt Flesch
Univ of Wisconsin, Madison

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