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I-Mode Exhaust Experiments on ASDEX Upgrade[1] M.L. REINKE, Oak Ridge National Laboratory, T. HAPPEL, Max-Planck-Institut fr Plasmaphysik, A. HUBBARD, MIT Plasma Science and Fusion Center, D. BRIDA, M. FATISCH, Max-Planck-Institut fr Plasmaphysik, L. GIL, Instituto de Plasmas e Fuso Nuclear, Instituto Superior Tcnico, O. GROVER, Institute of Plasma Physics of the Czech Academy of Sciences, W. MCCARTHY, MIT Plasma Science and Fusion Center, A. MERLE, Ecole Polytechnique Fdrale de Lausanne, Swiss Plasma Center, D. SILVANGNI, Physik-Department E28, Technische Universitt Mnchen, E. TRIER, Max-Planck-Institut fr Plasmaphysik, E. VIEZZER, Dept. of Atomic, Molecular and Nuclear Physics, ASDEX UPGRADE TEAM[2], EUROFUSION MST1 TEAM[3]
— Experiments conducted on ASDEX Upgrade (AUG) investigating the compatibility of dissipative divertors with high performance I-modes show plasmas exhibit a prompt, I/L back-transition prior to significant reductions in divertor heat flux when seeding nitrogen into the private flux region. The I-mode regime is currently being explored as a candidate reactor scenario, leveraging its demonstrated access to enhanced energy confinement, H_{98} >1.0, while maintaining L-mode-like impurity confinement and avoiding large ELMs. Recently published attempts to integrate I-mode with detached divertor operation on Alcator C-Mod are introduced to give context to new AUG experiments at 1.0 MA, 2.5 T, with densities of 4-5e19 m^{-3}. In AUG, ECH heating of ˜2.2 MW is used to enter into a stationary I-mode, reaching pedestal-top T_e ˜900 eV. Private flux N_2 seeding at rate necessary to cause reductions in divertor heat flux, 3.0-6.0e21 el/s, results in an I/L back-transition within 1-2

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[2]See author list of H. Meyer et.al. 2019 Nucl. Fusion accepted (https://doi.org/10.1088/1741-4326/ab18b8)
[3]See author list of B. Labit et al 2019 Nucl. Fusion 59 086020

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