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Neutral beam heating and current drive on MAST M.R. TOURNIANSKI, ROB AKERS, G. CUNNINGHAM, P.G. CAROLAN, D.L. KEELING, EURATOM/UKAEA Fusion Association, Culham Science Centre, Abingdon, OX14 3DB, UK — Heating and NBCD studies on MAST benefited from recent diagnostic upgrades such as T_i and V_ϕ profiles on the ion Larmor radius scale by improved CXRS and bremsstrahlung imaging to measure Z_{eff} profiles. The operational flexibility of MAST has also been improved by implementation of digital plasma control and real time optical edge detection and position control. These enhancements, combined with the access offered by the large MAST vessel, have been exploited for the study of off-axis heating and NBCD in vertically displaced SND plasmas. These had a neutron yield and stored energy comparable to up-down symmetric DND discharges with on-axis NBI. The extreme features of low aspect ratio devices can have a strong effect on the behaviour of fast ions, potentially influencing their heating and NBCD properties. The experimental results and modelling of off-axis NBI in SND (upper and lower) and on-axis NBI in DND will be presented and compared in terms of heating and NBCD.

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