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Modelling of Divertor Detachment in MAST Upgrade[1] DAVID MOULTON, MATTHEW CARR, JAMES HARRISON, ALEX MEAKINS, Culham Centre for Fusion Energy — MAST Upgrade will have extensive capabilities to explore the benefits of alternative divertor configurations such as the conventional, Super-X, x divertor, snowflake and variants in a single device with closed divertors. Initial experiments will concentrate on exploring the Super-X and conventional configurations, in terms of power and particle loads to divertor surfaces, access to detachment and its control. Simulations have been carried out with the SOLPS5.0 code validated against MAST experiments. The simulations predict that the Super-X configuration has significant advantages over the conventional, such as lower detachment threshold (2-3x lower in terms of upstream density and 4x higher in terms of PSOL). Synthetic spectroscopy diagnostics from these simulations have been created using the Raysect ray tracing code to produce synthetic filtered camera images, spectra and foil bolometer data. Forward modelling of the current set of divertor diagnostics will be presented, together with a discussion of future diagnostics and analysis to improve estimates of the plasma conditions.

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