# Interpretative modelling of the target ion flux rollover in Conventional and Super-X divertor configurations on MAST Upgrade

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The first scientific campaign of MAST Upgrade has demonstrated improved access to detachment in L-mode for the connected double null (CDN) Super-X divertor configuration compared to the CDN Conventional; the required outer mid-plane separatrix electron density for outer target ion flux rollover, $n_{e,sep,OMP,roll}$, was a factor ~2 higher in the latter [1]. In this contribution, we present the first interpretative modelling of these experiments using the SOLPS-ITER code. Simulated inner mid-plane puff scans have been successfully converged with drift and current terms activated. The drifts tend to bring the simulations closer to the experimental data (without drifts, $n_{e,sep,OMP,roll}$ is 3 times higher in Conventional; with drifts, $n_{e,sep,OMP,roll}$ is 2.5 times higher in Conventional, i.e. closer to the experimentally observed factor 2). The absolute magnitude of $n_{e,sep,OMP,roll}$ is also well reproduced for the Super-X configuration. The anomalous perpendicular transport coefficients required to obtain a reasonable match to experimental profiles were similar to those reported for MAST [2]. Further effects of drifts on the simulated up-down and in-out asymmetries will be presented, as will a detailed comparison to experimental profiles, and an analysis of the dominant terms driving the differences between Conventional and Super-X configurations.

[1] J. Harrison et al. 2022, Submitted to PRL.

[2] E. Havlíčková et al. 2015, Plasma Phys. Control. Fusion **57** 115001