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Evolution of pressure drop during detachment in the TCV tokamak O. FEVRIER, C. THEILER, EPFL, SPC, C. K. TSUI, UCSD, K. VERHAEGH, University of York, R. MAURIZIO, B. LABIT, H. REIMERDES, B. DUVAL, EPFL, SPC, J.A. BOEDO, UCSD, B. LIPSCHULTZ, University of York, TCV TEAM[1], EUROFUSION MST1 TEAM[2] — To ensure safe power exhaust in future fusion reactors will require, at the least, partially detached divertor operation. To further understand the dynamics of this process, we investigate detachment on TCV in a lower single-null geometry by examining the evolution of the profiles of plasma density, temperature, and pressure at the outboard midplane ("upstream") and at the outer strikepoint ("target"). A fast reciprocating probe is plunged at different times of reproducible discharges throughout the detachment process. Its measurements are compared with target measurements from probes and infrared thermography. As expected, the roll-over of the ion flux, often used experimentally to identify detachment, coincides with a pressure drop along the field lines. This is compared quantitatively with expectations from an extended two-point model where radiation and momentum losses are evaluated from bolometry and probe data. The roll-over coincides with the onset of " density shoulders " at the outer midplane. These are observed in the upstream density profiles and in bolometric and AXUV measurements, that show a radiation increase at the outer midplane. The application of these findings to detachment in advanced divertor geometries will be discussed.

[1]See the author list of S. Coda et al, 2017 Nucl. Fusion 57 102011
[2]See the author list of H. Meyer et al 2017 Nucl. Fusion 57 102014

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