DPP14-2014-000806

Abstract for an Invited Paper
for the DPP14 Meeting of
the American Physical Society

X-point-position-dependent intrinsic rotation in the edge of TCV[1]

TIMOTHY STOLTZFUS-DUECK, Princeton University

A simple transport-based theoretical model predicts that intrinsic toroidal rotation in the tokamak edge should depend strongly on R_X, the major-radial position of the X-point, including a sign change to counter-current rotation for adequately outboard X-point. To test the prediction, an R_X scan was conducted in Ohmic L-mode shots on TCV, in both USN and LSN configurations. The strong linear dependence on R_X was experimentally observed, with quantitative magnitude corresponding to a realistic value for the theory's corresponding input parameter. Although peaked rotation profiles complicate the comparison of absolute rotation values, the data is consistent with the predicted sign change. The core rotation profile shifted fairly rigidly with the edge rotation value, maintaining a relatively constant core rotation gradient. Core rotation reversals, triggered accidentally in a few shots, had little effect on the edge rotation velocity. Edge rotation was modestly more counter-current in USN than LSN discharges.

[1]This work was supported in part by the Swiss National Science Foundation and in part by the European Atomic Energy Community, and is subject to the provisions of the European Fusion Development Agreement.