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Effect of divertor geometry on turbulent transport in the SOL: a quantitative comparison between TCV experiments and GBS turbulence simulations DAVIDE GALASSI, MAURIZIO GIACOMIN, DIEGO SALES OLIVEIRA, PAOLO RICCI, CHRISTIAN THEILER, CLAUDIA COLANDREA, HUGO DE OLIVEIRA, SOPHIE GORNO, NICOLA OFFEDDU, HOLGER REIMERDES, Ecole Polytechnique Federale de Lausanne, TCV TEAM — Alternative divertor configurations represent a possible solution to the power exhaust problem in tokamaks. Most of these configurations act on the poloidal length of the divertor legs, the strike point radius, and the flux expansion at the target, aiming to facilitate the access to a highly dissipative, detached divertor regime. The largest uncertainties in the prediction of the optimal geometry are related to the effect of geometry on Scrape-Off Layer (SOL) turbulence. The dependence of turbulence on divertor geometric parameters was experimentally investigated on TCV, exploiting the extensive diagnostic coverage of the edge plasma, including a Reciprocating Divertor Probe Array. This analysis identifies the poloidal divertor leg length as the parameter leading to the largest variation in the SOL heat flux width. These experiments were run at lowered toroidal field, allowing for quantitative comparison with full-size, 3D fluid turbulence simulations performed with GBS [Ricci et al., Plasma Phys. Control. Fusion 2012] in realistic magnetic geometries. A validation of these simulations against experiments through a rigorous procedure will be presented.

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