Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Initial exploration of scenarios with Internal Transport Barrier in the first NBI-heated L-mode TCV plasmas CHIARA PIRON, Consorzio RFX (CNR, ENEA, INFN, Università di Padova, Acciaierie Venete SpA), OLIVIER SAUTER, STEFANO CODA, ANTOINE MERLE, ALEXANDER KARPUSHOV, Ecole Polytechnique Fédérale de Lausanne (EPFL), Swiss Plasma Center (SPC), LEONARDO PIGATTO, TOMMASO BOLZONELLA, PAOLO PIOVESAN, NICOLA VIANELLO, Consorzio RFX (CNR, ENEA, INFN, Università di Padova, Acciaierie Venete SpA), TCV TEAM, EUROFUSION MST1 TEAM —
Fully non-inductive operation of high performance plasmas is one of the main objectives of contemporary Tokamak research. In this perspective, plasmas with Internal Transport Barriers (ITBs) are an attractive scenario, since they can attain a high fraction of bootstrap current [1]. In this work we start exploring ITB scenarios on the Tokamak à Configuration Variable (TCV) heated by a newly available 1MW Neutral Beam Injector (NBI) [2]. Here we investigate for the first time in this device the impact of the additional NBI power on the performance and stability of L-mode plasmas with ITBs [3]. Results of both experimental data analyses and ASTRA transport simulations are presented. The work examines also the Magneto Hydro-Dynamics (MHD) activity and stability of the explored plasmas. In particular, the role of plasma magnetic equilibrium parameters, such as plasma elongation and triangularity, on the sustainment of these NBI-heated ITB scenarios is discussed. [1] R. C. Wolf et al 2003 Plasma Phys. Control. Fusion 45 R1 [2] A. N. Karpushov et al 2015 Fusion Eng. Des. 96-97 493 [3] S. Coda et al 2007 Nucl. Fusion 47 714

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Date submitted: 11 Jul 2016 Electronic form version 1.4