## Abstract Submitted for the DPP15 Meeting of The American Physical Society

HELENA code with incompressible parallel plasma flow<sup>1</sup> GEORGE THROUMOULOPOULOS, GEORGE POULIPOULIS, University of Ioannina, Greece, CHRISTIAN KONZ, Max-Planck-Institut für Plasmaphysik, Garching, Germany, EFDA ITM-TF TEAM — It has been established that plasma rotation in connection to both zonal and equilibrium flow can play a role in the transitions to the advanced confinement regimes in tokamaks, as the L-H transition and the formation of Internal Transport Barriers. For incompressible rotation the equilibrium is governed by a generalized Grad-Shafranov (GGS) equation and a decoupled Bernoulli-type equation for the pressure. For parallel flow the GGS equation can be transformed to one identical in form with the usual Grad-Shafranov equation. In the present study on the basis of the latter equation we have extended HELENA, an equilibrium fixed boundary solver integrated in the ITM-TF modeling infrastructure. The extended code solves the GGS equation for a variety of the two free-surface-function terms involved for arbitrary Afvén Mach functions. We have constructed diverted-boundary equilibria pertinent to ITER and examined their characteristics, in particular as concerns the impact of rotation. It turns out that the rotation affects noticeably the pressure and toroidal current density with the impact on the current density being stronger in the parallel direction than in the toroidal one. Also, the linear stability of the equilibria constructed is examined

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