Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Toroidal flow: Increasing complexitiy in the interaction between fast particles and magnetohydrodymanical waves JAN-WILLEM BLOKLAND, FOM Institute for Plasma Physics Rijnhuizen, Assocation EURATOM-FOM, Trilateral Euregio Cluster, Nieuwegein, The Netherlands, SIMON PINCHES, EURATOM/CCFE Fusion Association, Culham Science Centre, Culham, Abingdon, OX14 3DB, United Kingdom — In many tokamak experiments, neutral beam injection is used for additional heating, with the injected particles inducing a net rotation of the plasma. This rotation plays an important role in the stability of the system and in the interaction between the fast particles and the bulk plasma. However, in the next generation of tokamaks, the plasma rotatation is expected to be significantly slower and therefore the influence of rotation in present devices needs to be investigated and understood in detail. We present a fully consistent model of the bulk plasma, the fast particles and their interaction. The bulk is described by the MHD equations, whilst for the fast particles a kinetic description is used. The equilibria are computed using the FINESSE code and their stability is analysed using the PHOENIX code. Both codes take arbitrary toroidal flow into account. The HAGIS code, extended to consistently include flow, is used to simulate the fast particles. Model results for tokamaks with circular cross-section and JET-like equilibria show a complex dependence of the plasma stability upon the rotation.

Jan-Willem Blokland
FOM Institute for Plasma Physics Rijnhuizen, Assoc. EURATOM-FOM,
Trilateral Euregio Cluster, Nieuwegein, The Netherlands

Date submitted: 14 Sep 2010 Electronic form version 1.4