Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Vlasov tokamak equilibria with shearad toroidal flow and anisotropic pressure[1] GEORGE THROUMOULOPOULOS, University of Ioannina, Greece, APOSTOLOS KUIROUKIDIS, Technological Education Institute of Serres, Greece, HENRI TASSO, Max-Planck-Institut für Plasmaphysik, Garching, Germany — By choosing appropriate deformed Maxwellian ion and electron distribution functions depending on the two particle constants of motion, i.e. the energy and toroidal angular momentum, we reduce the Vlasov axisymmetric equilibrium problem for quasineutral plasmas to a transcendental Grad-Shafranov-like equation. This equation is then solved numerically under the Dirichlet boundary condition for an analytically prescribed boundary possessing a lower X-point to construct tokamak equilibria with toroidal sheared ion flow and anisotropic pressure. Depending on the deformation of the distribution functions these steady states can have toroidal current densities either peaked on the magnetic axis or hollow. These two kinds of equilibria may be regarded as a bifurcation in connection with symmetry properties of the distribution functions on the magnetic axis.

[1]This work has received funding from (a) the National Programme for the Controlled Thermonuclear Fusion, Hellenic Republic, (b) Euratom research and training programme 2014-2018 under grant agreement No 633053.

George Throumoulopoulos
University of Ioannina, Greece

Date submitted: 20 Jul 2015 Electronic form version 1.4