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FRC fast ion distribution: stability and effects on equilibrium LAURA GALEOTTI, LOREN STEINHAUER, FRANCESCO CECCHERINI, SEAN DETTRICK, TAE TEAM, TAE Technologies INC. — Experimental FRC equilibria in TAE's C-2W experiment can be studied utilizing TAE's 2D hybrid equilibrium code which combines the thermal plasma multi-fluid description of TAE's equilibrium code [1] with a kinetic treatment of fast ions added with a MonteCarlo code (MC) through NB injection. These hybrid equilibria may be characterized by "non-standard" structures such as current density profiles with a radial double hump and peaks at turning points as well as an inverted fast-ion distribution function, i.e., df/dv >0. Since an inverted population can affect the stability of the system through the generation of microinstabilites like drift-cyclotron loss-cone (DCLC) and Alfvèn-ion cyclotron (AIC), we address the effect of non-Maxwellian distribution functions on equilibrium structures, their stability, and the diagnosable signatures of these equilibria. Our investigation is carried out mainly through studies of fast ion orbits and distribution functions. *[1] L. Galeotti et al. Phys. Plasmas 18 082509 (2011)*

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