Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Kinetic non-Maxwellians, from theory to experiments[1] OLIVIER IZACARD, Lawrence Livermore National Laboratory — This contribution shows strong progresses on the analytic prediction of some kinetic effects (e.g., presence of super-thermal particles) on a selection of theories which usually assume a Maxwellian distribution function (MDF). The new method developed is based on the use of non-orthogonal basis sets to represent analytic non-Maxwellian distribution functions (NMDFs). This choice is motivated by its efficiency to model experimental and numerical NMDFs computed by PIC or Fokker-Plank codes and its capability to extract physical interpretation. We particularly introduce an interpreted NMDF which helped to understand the origin of the TS-ECE discrepancy (up to 20% on the electron temperature due to less than 2% of non-thermalized particles) observed in JET and TFTR. Additional results are discussed such as the inconsistency of the empirical SEE formula with a MDF, and the replacement of a diffusion ad-hoc coefficient by NMDFs. Finally, we show inclusion of kinetic effects in generalized fluid models and we focus our discussion on experimental perspectives toward NSTX-U measurements of NMDFs with different diagnostics. A part of this work is disseminated in Refs.[1,2].
[1] O. Izacard, Phys. Plasmas 23, 082504 (2016) [2] O. Izacard, Submitted to J. Plasma Phys. (2016)
Footnote: LLNL-ABS-702319

[1]Supported by U.S. Department of Energy Contract No. DE-AC52-07NA27344.

Olivier Izacard
Lawrence Livermore National Laboratory

Date submitted: 12 Sep 2016 Electronic form version 1.4