Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Fokker-Planck diffusive law: its interpretation in the context of plasma transport modeling[1] RAUL SANCHEZ, BEN A. CARRERAS, Oak Ridge National Laboratory, BOUDEWIJN PH. VAN MILLIGEN, Asociacion EURATOM-CIEMAT, Spain. — It was recently proposed that, when building phenomenological transport models for particle transport in tokamaks, use of the Fokker-Planck diffusive law might be preferable to Fick's law to express particle fluxes [1]. In particular, it might offer a possible explanation for the excessive pinch velocites observed in some experimental situations with respect to the values expected from the forces and asymmetries existent in the system. In spite of the fact that Fokker-Planck's law was first proposed many years ago, it produces a series of counterintuitive results that at first sight seem in contradiction with the second law of thermodynamics. In this contribution we will review the basic concepts behind its formulation and show that, through the use of simple examples relevant to plasma physics, the second law of thermodynamics is not violated in any manner if properly used. The benefits of its use within the modelling of transport in tokamaks will also be clarified.
REFERENCES: [1] R. Sanchez et al, Phys. Plasmas **12**, 056105 (2005); B.Ph. van Milligen et al, Plasma Phys.Contr.Fusion **47**, B743 (2005)

[1]Research sponsored by the Laboratory Research and Development Program of Oak Ridge National Laboratory, managed by UT-Battelle, LLC, for the US DOE under Contract No. DE-AC05-00OR22725

Raul Sanchez
Oak Ridge National Laboratory

Date submitted: 21 Jul 2006 Electronic form version 1.4