

Abstract Submitted
for the GEC09 Meeting of
The American Physical Society

On Application of Transport Coefficients in Plasma Modelling

Z. LJ. PETROVIC, S. DUJKO, Z. NIKITOVIC, D. MARIC, G. MALOVIC, Institute of Physics Belgrade, R.E. ROBSON, R.D. WHITE, James Cook University Townsville — In this paper we review recent developments in the transport theory as developed to deal with the so-called swarm experiments. We analyze where and how such results can affect the outcome of the plasma models [1]. In principle it is well understood that modeling of plasmas requires representing a large number of processes, and for a large group of these one does not know all the pertinent physical processes and even more so there is a general shortage of data. In that respect insisting on purity in the representation of the charged particle, in particular electron transport seems unnecessary. Nevertheless we wish to draw attention that neglecting some aspects of electron transport may lead to neglecting some important aspects of physics. We wish to draw attention to proper representation of the transport in crossed electric and magnetic fields, differences between flux and bulk transport properties under appreciable influence of non-conservative processes, temporal development of transport coefficients, anisotropy of diffusion and anomalous longitudinal diffusion when field changes direction and many more. Finally we wish to draw attention that plasma models should be benchmarked against basic swarm test models to verify how adequate the representation of some processes is. The stage of development of plasma models has reached such sophistication that perhaps requires that all aspects should be developed at the best available level. [1] RE Robson et al. Rev.Modern Phys. 77 (4) (2005) 1303.

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Date submitted: 12 Jun 2009

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