

# **Kinetic study of the parallel transport in the edge plasma**

*David Tskhakaya*

University of Innsbruck, Austria

It is assumed that the parallel transport represents one of the most well-understood processes in plasma. For the plasma edge (i.e. the plasma layer near the chamber wall) this statement is not really applicable - there are still unknown effects requiring explanation. In this presentation I will describe massively parallel kinetic simulations of the plasma edge indicating necessity to revise some of well established views on transport in the plasma edge.

The lecture will include

1. Short description of the PIC (particle in cell) simulation technique.
2. Estimation of new possibilities given by massively parallel PIC modeling.
3. Discussion of massively parallel kinetic modeling of the SOL (Scrape off layer – plasma edge in fusion devices). We attempt to explain some experimental observations (plasma probe measurements); discuss the “surprising” behavior of parallel transport coefficients in so called high recycling and ELMy (Edge-Localized Modes) SOLs, as well as the sensitivity of simulation results to PSI-processes implanted into the model.
4. At the end I present latest PIC simulation results for linear plasma devices (the DP machine Innsbruck and the Pilot-PSI).