P 17 Hauptvortrag 5: Plasma-Wand Wechselwirkung

Zeit: Mittwoch 09:20–10:00 Raum: 1002

Hauptvortrag P 17.1 Mi 09:20 1002

Progress in divertor modeling for ITER and future fusion devices — •Detlev Reiter and Vladislav Kotov — Institut für Plasmaphysik, Forschungszentrum Jülich GmbH, EURATOM Association, Trilateral Euregio Cluster, 52425 Jülich, Germany

The prediction of plasma- and material surface conditions in the ITER divertor remains a major challenge in computational science. 2D edge codes - combined with improved edge diagnostics are the current tools to separate, computationally, "known" (already solved, often "classical") aspects of SOL physics from the still "unknown" features of edge plasmas. Integrated transport codes are instrumental in addressing a number of ITER relevant issues, e.g. the operational window for acceptable target power, helium exhaust, target lifetime / impurity migration, tritium retention, core boundary conditions, etc. Significant progress has been made in the recent years [1], including code developments in neutral/radiation transport, study of fast ion effects, ELM buffering, drift modeling etc. The identification of outstanding problems has also continued including application of drifts, modeling hydrocarbon migration, the issue of how to deal with peripheral turbulent transport and main wall interactions, ELMs, difficulties in describing the details of detachment, etc. Despite these first steps are currently undertaken to model intrinsically 3D edge plasmas, e.g. with the EMC3-EIRENE Code applied to TEXTOR. The status of predictive 2D and 3D edge modeling will be reviewed and the remaining major open issues will be summarized.

[1] "Tokamak Physics Basis for Burning Plasmas", sect. 4.3, A. Kukushkin, D. Reiter, P.C. Stangeby (co-editors), Nucl. Fusion, (2006)