

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Field line reconstruction for edge transport modeling in non-axisymmetric tokamaks configurations¹ HEINKE FRERICHS, OLIVER SCHMITZ, IAN WATERS, Univ of Wisconsin, Madison, TODD EVANS, General Atomics, YUHE FENG, MPI Greifswald, VLAD SOUKHANOVSKII, LLNL — Symmetry breaking effects such as resonant magnetic perturbations (RMPs) present a challenge for the numerical analysis of divertor operation, because they require three dimensional models. One such model is provided by the EMC3-EIRENE code, which is based on a finite flux tube grid for field line reconstruction that allows to account for realistic, three dimensional configurations. We present the Field Line Analysis and Reconstruction Environment (FLARE) - a collection of tools for the analysis of the magnetic field structure. It includes a flexible grid generator which allows to set up plasma transport simulations for single and double null configurations (both disconnected and connected). This includes the “snowflake minus” topology, and we present an application for a “near-exact snowflake” configuration at NSTX-U. Recent edge plasma simulations for DIII-D and ITER include plasma response effects as calculated by the M3D-C1 code, and it is found that these configurations require a local adjustment of radial/poloidal resolution in order to maintain a reasonable level of magnetic flux conservation.

¹This work is supported in part by the U.S. Department of Energy under DE-SC0012315 and DE-FC02-04ER54698, and by Start-Up Funds of the University of Wisconsin - Madison.

Heinke Frerichs
Univ of Wisconsin, Madison

Date submitted: 22 Jul 2015

Electronic form version 1.4