Overview of edge modeling efforts for advanced divertor configurations in NSTX-U with magnetic perturbation fields*

H. Frerichs[1], O. Schmitz[1], I. Waters[1], G. P. Canal[2], T. E. Evans[2], Y. Feng[3],V. A. Soukhanovskii[4]

[1]*University of Wisconsin-Madison, Madison, WI, USA*
[2]*General Atomics, San Diego, CA, USA*
[3]*Max-Planck Institut fuer Plasmaphysik, Greifswald, Germany*
[4]*Lawrence Livermore National Laboratory, Livermore, USA*

Lead-author e-mail: hfrerichs@wisc.edu

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. The family of "snowflake" divertor configurations includes a variety of magnetic topologies. We present an overview of different "snowflake" configurations and their interaction with an externally applied RMP field with base mode number n = 3 at NSTX-U. Furthermore, 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 with the EMC3-EIRENE code. It also includes a set of tools to analyze the quality of field line reconstruction in the transport code, and we will present a comparison between a low aspect ratio NSTX-U configuration and a high aspect ratio DIII-D configuration.