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Numerical Study of the Impact of Resonant Magnetic Perturbations on Recycling Sources In Advanced Divertor Configurations of NSTX-U IAN WATERS, KURT FLESCH, HEINKE FRERICHS, OLIVER SCHMITZ, Univ of Wisconsin, Madison, JOON-WOOK AHN, Princeton Plasma Physics Laboratory, GUSTAVO CANAL, TODD EVANS, General Atomics, VSEVOLOD SOUKHANOVSKII, Lawrence Livermore National Laboratory — Explorations are under way to optimize the magnetic topology in the plasma edge of NSTX-U with the goal of improving neutral and impurity fueling and exhaust. Advanced divertor configurations combined with resonant magnetic perturbation (RMP) fields are being considered to improve peak heat and particle loads, stabilize edge instabilities, adjust plasma refueling, and control impurity transport. In this study, the EMC3-EIRENE fluid plasma and kinetic neutral transport code is used to investigate snowflake divertor configurations with and without RMP fields. Analysis of the edge recycling sources show that RMP fields induce a transition from a linear recycling regime into a high recycling regime at densities that are lower than in non-perturbed cases. This transition is also accompanied by a shift in the spatial distribution of these recycling sources and neutral atoms, and is impacted by the strength of the perturbations. An overview of results from different standard and snowflake divertor configurations will be presented. This work was funded by the Department of Energy under grant DE-SC0012315.

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