Multi-species Kinetic-Kinetic Plasma-Neutral Transport Simulations with XGC-DEGAS2[1] D.P. STOTLER, C.S. CHANG, Princeton Plasma Physics Laboratory — The role of neutral fueling in the buildup of the H-mode pedestal is of great interest due to the predicted sensitivity of ITER's performance to pedestal parameters. The effects of kinetic neutral and plasma phenomena on the pedestal buildup are being examined via the coupled DEGAS2 Monte Carlo neutral and XGC0 neoclassical particle transport codes. The coupled DEGAS2 neutral and XGC1 turbulence codes will be discussed at this conference by J. Lang, et al. Example pedestal fueling simulations utilizing XGC0-DEGAS2's time-dependent, consistent recycling capability have been described previously.[2] However, only deuterium ions and atoms were considered in that paper. Here, we will report on a generalized plasma-on-neutral collision routine in XGC0-DEGAS2 that handles multiple ion species and extends the list of modeled atomic collision processes. First, we will utilize XGC0's existing kinetic electron capability in processing electron impact ionization. Second, neutral impurities will be added as the next step towards a complete impurity model in XGC0. Third, deuterium molecules and molecular collision processes will be incorporated. Relevant edge physics results will also be discussed.

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