

Abstract Submitted
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Development of a Coupled Kinetic Plasma - Neutral Transport Code¹ D.P. STOTLER, PPPL, C.S. CHANG, G. PARK, NYU, CPES TEAM — Monte Carlo neutral transport codes have been run in conjunction with fluid plasma transport codes for more than a decade. The logical next step is to couple a Monte Carlo neutral transport package to a kinetic plasma transport code. The XGC neoclassical particle transport does just this with a built-in, rudimentary Monte Carlo neutral transport routine. A primary objective of the Center for Plasma Edge Science project is the replacement of this routine with a more general routine based on the DEGAS 2 Monte Carlo neutral transport code. As was done by XGC's neutral routine, the DEGAS 2 neutrals collide off of a fluid plasma background with its moments computed from the kinetic XGC ions. The resulting neutral density, flow velocity and temperature profiles are passed back to XGC. XGC's ions and electrons collide off of this background using the same ionization and charge exchange rates employed in the neutral transport calculation. We describe an approach to the coupling that ensures overall conservation of particles, momentum, and energy so as to avoid an accumulation of spurious sources that could compromise the accuracy of the simulation.

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Daren Stotler
Princeton Plasma Physics Laboratory

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