

Abstract Submitted  
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**NUBEAM Sources in FACETS**<sup>1</sup> A. PLETZER, Tech-X Corp., D. MCCUNE, K. INDIRESHKUMAR, PPPL, A. MORRIS, Paratools Inc., A. PANKIN, Lehigh U., J.R. CARY, Tech-X Corp., FACETS TEAM — The SciDAC project for the development of a Framework Application for Core Edge Transport Simulation (FACETS) aims at producing tokamak core-to-wall transport simulations on massively parallel architectures. Here, we report on the progress of integrating the new parallel, Plasma\_State based, Monte-Carlo NUBEAM module into the FACETS framework to provide neutral beam and fusion source terms in the plasma core diffusion equations. NUBEAM has recently been improved to facilitate invocation from third party software (e.g. SWIM). This was achieved by consolidating 100s of input variables into separate structures according to machine specificity, shot specificity, or time-slice specificity. Thanks to a combination of auto-generated code and a newly developed methodology for exposing Fortran90 derived types to C, all derived type members of NUBEAM structures have become in-memory accessible to FACETS's C++ infrastructure. NUBEAM, which is the first volumetric-coupling component in FACETS, has been wrapped with methods complying to the FACETS standard interface definition for easy interchangeability of modules at run time. Examples of neutral beam computations instrumented with TAU/Paratools on leadership class machines will be presented, as well as first coupled core-source FACETS simulations.

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