Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Investigation of Neutral Beam Arc Chamber Failure During Helium Operations at DIII-D[1] JASPER BECKERS, University of Technology, Eindhoven, The Netherlands, BRENDAN CROWLEY, J.T SCOVILLE, General Atomics, ROGER JASPERS, ANA SOBOTA, University of Technology, Eindhoven, The Netherlands — The Neutral Beam system on the DIII-D tokamak consists of eight ion sources using the Common Long Pulse Source (CLPS) design. During helium operation, desired for research regarding the ITER pre-nuclear phase, it has been observed that the ion source arc chamber performance steadily deteriorates, eventually failing due to electrical breakdown across the insulation. This poster presents the details and preliminary results of an experimental effort to replicate the problem in a bench top ion source with similar plasma parameters. The initial aim of the experiment is to test the hypothesis that during helium operation there is increased tungsten evaporation and sputtering due to ion bombardment of the hot cathodes, leading to the deposition of filament material on the insulation and subsequent short circuits. Ultimately the aim of the experiment is to find methods to ameliorate the problems associated with helium operation at DIII-D.

[1]Work supported by U.S. DOE under DE-FC02-04ER54698.

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Date submitted: 18 Jul 2017 Electronic form version 1.4