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Design and Control of Small Neutral Beam Arc Chamber for Investigations of DIII-D Neutral Beam Failure During Helium Operation.[1]
CARL FREMLIN, Rose-Hulman Inst of Tech, JASPER BECKERS, University of Technology, Eindhoven, The Netherlands, BRENDAN CROWLEY, JOSEPH RAUCH, JIM SCOVILLE, General Atomics — 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 of the insulation. A significant investment of manpower and time is required for repairs. To study the cause of failure a small analogue of the DIII-D neutral beam arc chamber has been constructed. This poster presents the design and analysis of the arc chamber including the PLC based operational control system for the experiment, analysis of the magnetic confinement and details of the diagnostic suite.

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