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Category Number and Subject: 5.6.2. DIII-D Tokamak

[ ] Theory [X] Experiment [ ] Combined/General

Commissioning of the off-axis neutral beamline on the DIII-D tokamak,* J.T. Scoville, C.J. Murphy, R.M. Hong, *General Atomics* – One of the four neutral beam injection systems on DIII-D has recently been rebuilt to allow off-axis injection. A system of hydraulically operated pistons was fit to the beamline to allow tilting up to an angle of 16.5 deg, enabling injection of 5 MW of neutral beam power up to 40 cm below the plasma centroid. Off-axis injection required rebuilding the two ion sources to produce more strongly focused and narrower beams that can inject the power at an angle through the port box of the vacuum vessel. The internal beamline collimation system was replaced with a new system compatible with the stronger focused sources. An extensive alignment process was carried out for all beamline internal components and ion sources. Extensive analysis has been carried out using thermocouple and calorimetry data to document the performance of the collimation system, leading to an extension of the allowable pulse length. We present a description of the modifications that were made to the ion sources and collimation systems and the results of heating and performance studies for the off-axis beam injection system.

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