

First operation in SPIDER and the path to complete MITICA

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Abstract:

The requirements of ITER neutral beam injectors (1 MeV, 40 A negative deuterium ion current for 1 h) have never been simultaneously attained; therefore, a dedicated Neutral Beam Test Facility (NBTF) was set up at Consorzio RFX (Padova, Italy). The NBTF includes two experiments: SPIDER (Source for the Production of Ions of Deuterium Extracted from Rf plasma), the full-scale prototype of the source of ITER injectors, with a 100 keV accelerator, to investigate and optimize the properties of the ion source; and MITICA, the full-scale prototype of the entire injector, devoted to the issues related to the accelerator, including voltage holding at low gas pressure. The present paper gives an account of the status of the procurements, of the timeline, and of the voltage holding tests and experiments for MITICA. As for SPIDER, the first year of operation is described, regarding the solution of some issues connected with the radiofrequency power, the source operation, and the characterization of the first negative ion beam.