**EP-8 Validation of neutral beam current drive and projections to ITER**

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| **TG priority:** High | **Start date:** 2016 | **Status:**  New | **Personnel exchange:**  No |
| **IO priority:** | **End date:** 2018 | **Motivation:** Physics Basis | |

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| **Device / Association** | **Contact Person** | **2016 TG Request** | **Activity (from JEX/JA spreadsheet)** | | | |
| **2016** | **2017** | **2018** |
| NSTX-U/PPPL | Podestà | Essential |  |  |  |
| TCV/EPFL | Testa | Desirable |  |  |  |
| MAST/CCFE | Keeling | Essential |  |  |  |
| AUG/IPP | Lauber | Desirable |  |  |  |
| DIIID/GA | Park | Desirable |  |  |  |

**Purpose**

Goals of this Joint Experiment are: (i) assess Neutral Beam Current Drive (NBCD) efficiency, including conditions for which energetic particle (EP) behavior may be expected to depart from ‘classical’; (ii) develop/validate modeling tools to predict NBCD in future devices, with focus on ITER scenarios, including ‘non-classical’ effects such as enhanced EP transport by instabilities or microturbulence. This study will benefit from considerable diagnostic and code developments during recent years, which enable more accurate characterization and modeling of the EP evolution.

**Plans for 2016**

* Begin NBCD experiments on NSTX-U. Target off-axis NBCD scenarios with elevated qmin>1. Begin with MHD-quiescent conditions to establish a reliable baseline for code and diagnostics validation. Explore scenarios with enhanced energetic particle transport by instabilities such as Alfvénic modes and characterize their impact on NBCD efficiency and NB-driven current profile evolution.
* As the new NBI system becomes available, begin experiments to assess the achievable Te/Ti ratio as a prelude for studies on EP transport by microturbulence and its impact on NBCD.
* Begin coordinated analysis of NBCD scenarios among participating devices; define plans for coordinated experiments on all devices in 2017/2018.