IOS-4.3 Collisionality scaling of confinement in advanced inductive plasmas

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| **TG priority:** Moderate | **Start date:** 2011 | **Status:**  On-going | **Personnel exchange:**  Yes |
| **IO priority:** | **End date:** 2016 | **Motivation:** Physics Basis | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Device /**  **Association** | **Contact**  **Persons** | **2016 TG Request** | **Activity (from JEX/JA spreadsheet)** | | | | |
| **2012** | **2013** | **2014** | **2015** | **2016** |
| DIII-D | T. Luce | Desirable | Committed | Considering | Considering | Analysis |  |
| JET | C. Challis | Desirable | Committed | Committed | Committed | Considering |  |
| AUG | J. Stober | Desirable | Committed | Committed | Analysis | Not doing |  |
| JT-60U | S. Ide | Desirable | Analysis | Analysis | Analysis | Analysis |  |
| NSTX-U | S. Kaye | Desirable | Analysis | Analysis | Analysis |  |  |

**Purpose**

Analysis of the ITPA advanced inductive scenario performance database indicated that there is a substantial increase in H98y2 with decreasing collisionality. Dedicated experiments are required to assess the impact on projection to ITER, since even a weak variation of confinement with collisionality can have a substantial influence, due to ITER lying at much lower collisionality than present-day experiments.

**Results for 2015**

* Further analysis of recent DIII-D experiments was carried out.

**Plans for 2016**

* JET experiments are planned, but have only backup status.
* Experiments in AUG, DIII-D, and JET have all indicated the difficulty of making matches in the profiles over sufficient range in collisionality to resolve the scaling accurately. This is planned to be reported in a conference paper, which will close this joint experiment.