Contribution ID: **620** Type: **Poster**

ITR/P1-18: Challenges in Burning Plasma Physics: the ITER Research Plan

Tuesday, 9 October 2012 08:30 (4 hours)

Following First Plasma, currently scheduled for late 2020, the ITER project aims to develop the capability for DT operation as rapidly as possible in order to address the key mission goal of demonstrating long pulse operation at Q ≥ 10 with approximately 500 MW of fusion power. The ITER Research Plan (IRP) has been developed to analyze the experimental programme necessary to develop ITER's operational capability from First Plasma to the achievement of the Q ≥ 10 mission goal. It integrates the experimental activities required to develop a robust capability for high current (15 MA) H-mode operation using DT fuel and, incorporating the planned schedule for the installation and commissioning of ITER auxiliary and plant systems, develops a schedule to allow full DT operation in late 2027 and the exploration of high fusion gain DT plasmas in 2028.
The experimental programme is foreseen to develop through 3 phases: H/ He (non-active), D and DT (nuclear). During the first phase, all systems necessary for operation at full technical performance (15 MA/ 5.3 T) will be commissioned and integrated into plasma operation to establish the plasma operating regimes and the plasma control capability required to provide a robust basis for the transition to DT Operation. A second, relatively short, phase in deuterium completes the plasma commissioning activities, allows H-mode operation to be extended to high current and DT relevant parameters, and initiates the transition to full DT operation via a series of "trace tritium"experiments.
The experimental programme on high fusion power DT scenarios to be explored in the third phase of operations must address several challenges in burning plasma physics to achieve and sustain the necessary level of fusion performance to satisfy the Q ≥ 10 mission goal. The paper will discuss the key physics issues to be resolved, the elements of the experimental programme foreseen to address them and the opportunities for burning plasma research which the experimental programme will provide.

Country or International Organization of Primary Author

ITER Organization

Primary author: Mr CAMPBELL, David (ITER)

Presenter: Mr CAMPBELL, David (ITER)

Session Classification: Poster: P1

Track Classification: ITR - ITER Activities