



Contribution ID: 634

Type: Poster

## EX/P2-17: Resonant and Non-resonant type Pre-ionization and Current Ramp-up Experiments on Tokamak ADITYA in the Ion Cyclotron Frequency Range

*Tuesday, 9 October 2012 14:00 (4h 45m)*

Here we report the pre-ionization experiments carried out in ICRF range using poloidal type fast wave antenna, and 200 kW RF system at 24.8 MHz frequency which corresponds to the second harmonic resonance layer at the center of the vacuum vessel of tokamak ADITYA at 0.825 T. The experiments are carried out in different phases like only RF plasma, RF plasma in presence of toroidal magnetic field, RF pre-ionization with higher loop voltages and then at lower loop voltages by decreasing current and then at lower loop voltages with constant volts-seconds. In last phase the current ramp-up is carried out at lower loop voltages as well as with slow rise time to simulate the requirements of steady state tokamaks like SST-1. The toroidal magnetic field is varied from 0.825 T to 0.075 T, pressure is varied from  $3 \times 10^{-5}$  torr to  $8.0 \times 10^{-4}$  torr and RF power is varied from 20 kW to 120 kW. The diagnostics used are Langmuir probes, visible camera, spectroscopy, soft and hard X-ray detection techniques, diamagnetic loop and microwave diagnostics like interferometer and reflectometer. After plasma production at different magnetic fields, the pre-ionization experiments are carried out at different loop voltages to ramp up the current and we could ramp up current at all available loop voltages starting from 22 volts to 8 volts of the ohmic loop voltage to get normal plasma discharge of 90 kA and 90 ms duration.

There exists a minimum value of the toroidal magnetic field (0.09T) below which no plasma spread is observed and also below 20 kW RF power we did not observe pre-ionization. It is observed that at lower loop voltages the current ramp-up is possible only in presence of pre-ionization.

### Country or International Organization of Primary Author

INDIA

**Primary author:** Mr KULKARNI, Sanjay (India)

**Co-authors:** Mr VARIA, Atul (Institute for Plasma Research); Mr KADIA, B R (Institute for Plasma Research); Mr GUPTA, C N (Institute for Plasma Research); Mr JADAV, H M (Institute for Plasma Research); Dr GHOSH, Joydeep (Institute for Plasma Research); Mr PARMAR, Kirit (Institute for Plasma Research); Mr MISHRA, Kishore (Institute for Plasma Research); Mr PARIHAR, Manoj (Institute for Plasma Research); Dr GUPTA, Manoj kumar (Institute for Plasma Research); Ms RAMAIYA, Nilam (Institute for Plasma Research); Mr ATREY, Pravin (Institute for Plasma Research); Prof. KAW, Predhiman K (Institute for Plasma Research); Mr TANNA, Rakesh (Institute for Plasma Research); Mr JOSHI, Ramesh (Institute for Plasma Research); Prof. JHA, Ratneshwar (Institute for Plasma Research); Mr BHATT, S B (Institute for Plasma Research); Mr JOISA, Shankar (Institute for Plasma Research); Mr KUMAR, Sunil (Institute for Plasma Research); Mr SRINIVAS, YSS (Institute for Plasma Research)

**Presenter:** Mr KULKARNI, Sanjay (India)

**Session Classification:** Poster: P2

**Track Classification:** EXW - Magnetic Confinement Experiments: Wave-plasma interactions; current drive; heating; energetic particles