Contribution ID: **105** Type: **not specified**

Design and preliminar operation of a laser absorption diagnostic for the SPIDER RF source.

Monday, 17 September 2018 11:00 (2 hours)

The ITER Heating Neutral Beam (HNB) injector is required to deliver 16.7 MW power into the plasma from a neutralised beam of H-/D- negative ions, produced by an ICP RF source and accelerated up to 1 MeV. To enhance the H-/D- production, the surface of the acceleration system grid facing the source (the plasma grid) will be coated with Cs because of its low work function. Cs will be routinely evaporated in the source by means of specific ovens. Monitoring the evaporation rate and the distribution of Cs inside the source is fundamental to get the desired performances on the ITER HNB.
In order to proper design the source of the ITER HNB and to identify the best operation practices for it, the prototype RF negative ion source SPIDER has been developed and built in the Neutral Beam Test Facility at Consorzio RFX. In SPIDER, the dynamics of Cs will be monitored by measuring the emission intensity of the Cs 852 nm line along several lines of sight in the source. For a more quantitative estimation of Cs density a Laser Absorption Spectroscopy diagnostic will be installed; by using a wavelength tunable laser, the diagnostic will measure the absorption spectrum of the 852 nm line along 4 lines of sight, parallel to the plasma grid surface and close to it. From the absorption spectra the line-integrated density of Cs at ground state will be calculated. The paper will present the design of the diagnostic for SPIDER, with a description of the layout and of key components. The paper will also show the first experimental results from a preliminary installation of the diagnostic on the test stand for Cs ovens.

Co-authors: Dr BARBISAN, Marco (Consorzio RFX); Dr PASQUALOTTO, Roberto (Consorzio RFX); Dr RIZZOLO, Andrea (Consorzio RFX)

Presenter: Dr BARBISAN, Marco (Consorzio RFX)

Session Classification: P1

Track Classification: Diagnostics