



Contribution ID: 15

Type: Poster

Techniques to Widen the Operational Space of SPIDER Radio Frequency Driven Plasma Source

Keywords: NBI, RF ion sources, RF oscillators

SPIDER is the full-size prototype of the ion source of the ITER Neutral Beam Injectors, and is in operation since June 2018 as part of the ITER Neutral Beam Test Facility. The ion source is composed of 8 Radio Frequency drivers supplied by 4 RF oscillators, rated for operation at 1 MHz, for a total power of 800kW.

This article presents an analysis on the effect of RF drivers and source biasing power supplies settings on plasma initiation and stability, with different magnetic filter field and pressure conditions inside the plasma source. The result of this analysis has brought to a new strategy for the selection of source biasing, to facilitate plasma initiation, and operating frequencies of the different RF generators, to minimize the plasma oscillations. This strategy allowed to improve the plant reliability at high RF power in a broader range of operational conditions in SPIDER.

E-mail for contact person

riccardo.casagrande@igi.cnr.it

Funding Information

This work has been carried out within the framework of the EUROfusion consortium and has received funding from the Euratom research and training programme 2014-2018 and 2019-2020 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.

Primary author: CASAGRANDE, Riccardo (Consorzio RFX)

Co-authors: Dr DAN, Mattia (Consorzio RFX); Dr MAISTRELLO, Alberto (Consorzio RFX)

Presenter: CASAGRANDE, Riccardo (Consorzio RFX)

Session Classification: Poster Session 1

Track Classification: Ion sources for fusion