

Tipo di tesi: Triennale

Corso di Laurea: Fisica

Tipologia: numerica

Titolo della tesi: Fluid Simulations of the Plasma in the Negative Ion Source - SPIDER

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Responsabile di Programma: Toigo

Argomento della tesi:

The experimental fusion reactor ITER will be heated by injection of fast neutral beams generated by accelerating and neutralizing negative ions. The negative ion source used for this purpose (SPIDER), constructed at the Consorzio RFX (Italy) consists of 8 driver volumes, where radiofrequency (RF) power is inductively coupled to the plasma electrons, and an expansion chamber containing a magnetic filter (MF). Numerical modelling is necessary to give insight and understanding of the physical processes in the SPIDER discharge. Self-consistent two-dimensional fluid description of the source, was developed and implemented into FORTRAN code (FSFS2D - Fluid Solver For SPIDER in 2D). Simulations have to be performed to compare the code results to experiment and to support the necessary changes in the SPIDER design.

The thesis activities include: extension of the fluid treatment of plasma and of the description of the fundamental processes present in the numerical model; definition of case studies for the comparison and interpretation of the experimental data; understanding the structure of the FSFS2D code and carrying out the necessary numerical simulations; analysis and presentation of the results.

Competenze richieste (se necessarie):

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Stato: non assegnata

Laureando/a: (quando sarà assegnata)