



Contribution ID: 356

Type: **not specified**

P4.020 Design of the small scale prototype accelerator for KSTAR negative-ion-based NBI

Thursday, 20 September 2018 11:00 (2 hours)

The small scale prototype negative ion source has been designed for KSTAR negative ion source. The target performance of the ion source is to extract 0.5 A of 200 keV D⁻. The aperture geometries of the accelerator grids are based on the ITER HNBI reference design and optimized for the small scale prototype ion source. The accelerator consists of plasma grid (PG), extraction grid (EG), and ground grid (GG). The nominal operation voltages of these grids are -200, -191, 0 kV for PG, EG, and GG, respectively. The extraction gap distance between PG and EG has been chosen as 6.0 mm, the same as ITER HNB extraction gap. 1-stage acceleration gap (between EG and GG) has been chosen as 100 mm. This is a compromise between high voltage holding of 200 kV and beam optics. Kerf plate (metallic plates around of the aperture) is also attached to the downstream surface of the extraction grid to compensate for the beamlet-beamlet interaction and to point the beamlets in the right direction. SmCo permanent magnets are employed to suppress the co-extracted electron currents in the extraction grid. The design of the accelerator for the neutral beam injection on KSTAR is finished and fabrications are currently in progress. In this presentation, the considerations and choices which constitute the basis of the design are described.

Presenter: KIM, Tae-Seong (Korea Atomic Energy Research Institute)

Session Classification: P4