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First Neutral Beam Injection Experiments in Versatile Experiment Spherical Torus

The neutral beam injection (NBI) system commissioning and first beam heating experiments in Versatile Experiment Spherical Torus (VEST) have been carried out. The ion beam power of ~ 0.6 MW was successfully extracted from the ion source through commissioning. The ion source consists of arc plasma source and multi-aperture accelerator assembly which is developed by Korea Atomic Energy Research Institute (KAERI). The KAERI accelerator system was designed to deliver a 0.6 MW with beam energy of 15 keV. The arc plasma source can make high power of ~ 60 kW Arc plasmas, which is enough for beam current of ~ 40 A in this accelerator system. By using this NB system, a hydrogen NB power of up to 0.6 MW was successfully injected to the VEST plasma. Difference of the plasma parameters by NB injection such as ion temperature, rotation, and plasma density was measured by using Thomson scattering system, passive emission spectroscopy and so on. From these experiment results, neutral beam injection efficiency will be discussed in comparison with those of the NUBEAM simulation.

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