
Contribution ID: **355** Type: **not specified**

# P4.019 Development of High-Power Pulse Neutral Beam Injection System for the Versatile Experiment Spherical Torus

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

A short-pulse and high power neutral beam injection (NBI) system is developed for the Versatile Experiment Spherical Torus (VEST) as a main plasma heating device. The NBI system is designed to inject above 0.5MW neutral beam heating power at the hydrogen ion beam energy of 20 keV in the pulse length of 10 ms. In addition, a design feature of VEST NBI system is changing the beam injection energy in the pulse duration by utilizing a pulse power system based on 2-stage Marx generator for the ion beam extraction and arc plasma generation. Change of the incident ion beam energy is required to reduce neutral beam losses resulting from the shine through and orbit loss under the low initial target plasma density and toroidal magnetic field strength of the VEST. Based on the design parameters, high power arc ion source and power supply system for VEST NBI system are successfully developed and commissioned.
In this paper, a summary of VEST NBI design features is described, and experimental results of pulse arc ion source and neutral beam transport in various operating conditions are presented.

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**Session Classification:** P4