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Application of magnetized coaxial plasma gun for external control of field-reversed configuration TOMOHIRO KIGUCHI, TAISUKE NISHIDA, NAOKI YAMAMOTO, TOMOHIKO ASAI, TSUTOMU TAKAHASHI, YASUYUKI NOGI, Nihon University, TOSHIKI TAKAHASHI, Gunma University — Magnetized coaxial plasma gun (MCPG) has been utilized to generate spheromak plasma. In this work, we propose to employ a MCPG as tools for pre-ionization, fueling and biasing of field-reversed configuration (FRC) plasma. Start-up experiments with a MCPG pre-ionization have been performed and a FRC has been formed successfully. In the case with a MCPG, the initial plasma density can be controlled with wider range comparing to conventional z-ionization method. As another application of a MCPG, biasing to control radial electric field through a “plasma electrode” has been proposed. The plasma electrode can be a method to control the electric field with less perturbation on FRC plasma. Control of the radial electric field has a potential to improve confinement property, excite the toroidal flow and change the relaxation process of FRC plasma.

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