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Behavior of a tracer-containing compact toroid in a transverse magnetic field DAICHI KOBAYASHI, TOMOHIKO ASAI, TAICHI SEKI, RIKA SASAKI, ASUNA MINAMIGI, Nihon University, HIROSHI GOTA, THOMAS ROCHE, TADAFUMI MATSUMOTO, AND THE TAE TEAM, TAE Technologies, Inc., NAOKI TAMURA, YOSHIRO NARUSHIMA, National Institute for Fusion Science, TOSHIKI TAKAHASHI, Gunma University — Fusion reactor plasma cooling can be caused by impurity contamination, which worsens plasma confinement. Therefore, studying the behavior of impurities in a magnetically confined plasma is of interest. A tracer-containing compact toroid (TCCT) injection technique that utilizes a magnetized coaxial plasma gun (MCPG) has been proposed as a new tracer injection method for impurity transport study [1]. The MCPG with a tracer source has been developed as a TCCT injector. The tracer source consists of a rod electrode made of tracer elements and a cylindrical electrode. The plasma containing tracer ions are generated by an independently controlled pulsed discharge in the tracer source. Then, the plasma is accelerated up to several hundreds of km/s by an MCPG discharge and ejected as a TCCT. The main purpose of this study is to observe impurity behavior in a field-reversed configuration (FRC) using the TCCT technique. Experiments on TCCT injection into a transverse magnetic field emulating the confinement magnetic field of an FRC have been conducted to understand whether tracer ions can be injected into FRCs without separation from a TCCT. [1] D. Kobayashi *et al.*, Rev. Sci. Instrum. **89**, 10I111 (2018).

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