

Abstract Submitted
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Plasma Dynamics of Translation process of Field-reversed Configuration KEN SAKURABA, Nihon University — To form high performance FRC plasmas with electron density of 10^{20}m^{-3} and low background neutral particles, a field-reversed theta pinch device, called NUCTE-III, modified and a confinement region with a quasistationary magnetic field is installed. A FRC translation experiment with super-Alfvénic velocity started. Initial experiment results are presented. FRC plasma, which has electron density of $\sim 2.5 \times 10^{21} \text{ m}^{-3}$, total temperature of 200 eV, poloidal flux of 0.5 mWb, separatrix radius of 0.05 m, plasma volume of $4 \times 10^{-3} \text{ m}^3$, has been translated with the first path velocity of 150 km/s, and the second path one of 50 km/s and settled down after two times reflections. Plasma volume, poloidal flux and separatrix radius of settled down FRC become $\sim 4 \times 10^{-2} \text{ m}^3$, 0.23 mWb and $\sim 0.1 \text{ m}$, respectively. The plasma had a lifetime of about 0.1ms and terminated by the growth of $n=2$ rotational instability. The velocity was yet a half of Alfvén one. High performance FRC plasma, which is formed on TCS, has not yet obtained. By the excluded flux and visible light optical measurements, dynamics of the translation process has been investigated.

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