

Control of Spontaneous Rotation in a Field-Reversed Configuration by Double-Sided Magnetized Plasmoid Injection

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- The injection of small plasmoids into a pre-existing field-reversed configuration (FRC) holds promise as a new *high-leverage* control method.
- Magnetized plasmoids from plasma guns are injected into the Nihon University Compact Toroid Experiment (NUCTE). Mounted co-axial with the FRC the guns are centered on the divertor / plasma streams.
- The plasmoids have < 2% of the inventory, < 10% of the poloidal flux, and ~10% of the temperature of the FRC. Even so they temporarily arrest the decay of poloidal flux and actually raise it by 30 - 40% (upper figure).
- Further, they limit FRC rotation (lower figure), the cause of rotational instability. Injected at $t \sim 0 \mu\text{s}$, the effect of the plasmoids on the FRC appears after a delay of $\sim 25 \mu\text{s}$.
- These results raise the possibility that intermittent injection of modest plasmoids along the divertor stream might become a useful control technique in future FRCs.

