Rotation of an FRC due to the reversed field theta pinch

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Toroidal rotation of a field-reversed configuration (FRC) plasma is observed in various experiments. Toroidal rotation of the plasma causes the n = 2 rotational instability which leads the plasma to disruption. Therefore, it is important for suppressing the instability to explain the mechanism of spin-up of an FRC plasma. Recently, we have shown that resistive flux decay can directly contribute to the ion angular momentum [1]. Here, a particle simulation is carried out to calculate the rotation velocity profile and its temporal evolution.

It is found that the resistive flux decay results in the toroidal rotation and the obtained time evolution of toroidal flow velocity has good agreement with the experimental results measured at the Nihon University Compact Torus Experiment-III device.

[1] T. Takahashi *et al*., PFR **2**, 008 (2007).