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Effects of External Magnetic Field on the Coupling between RF Antenna and FRC Plasma JERMAIN GOSS, XIAOKANG YANG, DHARA KALARIA, EZRA SIDNEY, TIAN-SEN HUANG, Prairie View A&M University — In FRC plasma driven by rotating magnetic field (RMF), the coupling between RF antenna and plasma is important to achieve high efficiency of plasma current drive. With the recent development of RF power measurement at Prairie View (PV) rotamak, a series of experiments are carried out to investigate the effects of external magnetic fields on the coupling. By using a toroidal magnetic field, the penetration of RMF is significantly improved due to the excitation of rotating whistler wave; therefore, the RF coupling is enhanced and plasma current is increased and even doubled in comparison with the FRC regime for the same RF power. By using magnetic shaping coils which provide axial magnetic field, even though the penetration of RMF surprisingly becomes worse, the RF coupling is substantially improved due to the increase of plasma elongation, and hence plasma current is boosted from 2 kA to 5.2 kA.

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