

Abstract Submitted  
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**Experimental investigation of magnetic-field topology via a perturbation method in the PFRC-2 device**<sup>1</sup> JACKSON MATTEUCCI, SAMUEL COHEN, Princeton Plasma Physics Lab — The fundamental question about FRC experiments is whether an FRC has actually formed; specifically, does there exist a magnetized, high-beta, plasma configuration with both no toroidal field and a simply connected configuration-space separatrix? We have investigated the latter part of this question, the existence of a separatrix, in the RMF<sub>o</sub>-driven PFRC-2 device. The method involved applying an externally generated periodic RF power perturbation to open-field-line plasma at one (remote) axial end of the device while simultaneously searching for evidence of this perturbation near the presumptive FRC. Measurements of the floating potential and ion saturation current were taken at the axial center of the device using a cylindrical Langmuir probe ( $r = 0.025$  cm). When applying no RMF<sub>o</sub>, measurements of the floating potential and the ion saturation current showed evidence of the frequency signature of perturbation throughout the entire radial profile of the device, indicating open field lines throughout the device. However, under certain conditions when operating the RMF<sub>o</sub>, we found no evidence of the perturbation within a certain radius, but instead see the perturbations only beyond this particular radius, indicating a separatrix inside which the magnetic field lines are closed.

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