

Abstract Submitted  
for the DPP16 Meeting of  
The American Physical Society

**Second Generation Magnetic Flux Array for the Terrestrial Reconnection Experiment (TREX)**<sup>1</sup> SAMUEL GREESS, JAN EGEDAL, JOE OLSON, JOHN WALLACE, MIKE CLARK, CARY FOREST, Univ of Wisconsin, Madison — TREX, part of the Wisconsin Plasma Astrophysics Laboratory, studies magnetic reconnection in a variety of regimes. In its prior configuration, TREX used two coils inside a 3m spherical vacuum vessel filled with plasma to create a magnetic field opposing a background field from an external Helmholtz coil, driving reconnection. In order to study the reconnection process, we first constructed a 160 channel Magnetic Flux Array, which allowed us to infer the flux function,  $\Psi$ , and thus the toroidal component of the vector potential,  $\mathbf{A}\phi$ , as a function of time over the array area. From  $\mathbf{A}\phi$ , we further found the field geometry, current density, and reconnection rate [1]. Following the success of this array [2], a second array was constructed with similar parameters but with the addition of a thin stainless steel shield to reduce noise and a set of toroidal field Bdot coils. Data from this second array in the most recent run of TREX will be presented and compared to the results from the first array. [1] Kesich et al., Review of Scientific Instruments 79,063505 (2008). [2] Olson et al., PRL (2016)

<sup>1</sup>Supported in part by DoE grant DE-SC0010463

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Date submitted: 14 Jul 2016

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