

Abstract Submitted  
for the DPP17 Meeting of  
The American Physical Society

**Spherical 3-Axis Hall Probe Array Calibration and Implementation for The Big Red Ball**<sup>1</sup> JACOB LYNN, Univ of Wisconsin, Madison, E. PETERSON COLLABORATION, D. ENDRIZZI COLLABORATION, M. CLARK COLLABORATION, C. B. FOREST COLLABORATION — A 3-axis Helmholtz coil capable of producing 100 G magnetic fields at frequencies ranging from DC to 1 kHz has been built to calibrate an array of 3-axis hall probes. Accurate magnetic field measurements are necessary for diagnosing plasma equilibria and the presence of any MHD instabilities. The array will consist of three single-axis Hall sensors mounted orthogonally, each of which has a frequency response of 100 kHz and a sensitivity of  $28 \frac{mV}{G}$ . These probes will be placed on the inner surface of the machine to create a spherical array of sensors. Such an array will provide the necessary data to constrain plasma equilibrium parameters, such as current density and plasma pressure from  $\nabla P = J \times B$ . Understanding the plasma equilibrium, and large-scale magnetic fields is critical to understanding the dynamics involved in many phenomena, like the dynamo. Details on the design, calibration, and implementation of the three-axis Helmholtz coil and Hall sensors will be presented.

<sup>1</sup>DoE and NSF

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Date submitted: 14 Jul 2017

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