Abstract Submitted
for the SES13 Meeting of
The American Physical Society

Mississippi State Axion Search KRIS MADSEN, Mississippi State University, MISSISSIPPI STATE AXION SEARCH COLLABORATION[1] — The Mississippi State Axion Search (MASS) is an effort to improve the limit on the mass-coupling parameter of the Axion, a boson first postulated in the Peccei-Quinn theory as a solution to the strong CP problem in QCD. The collaboration is using a variation of the light shining through a wall (LSW) technique, taking advantage of the Primakoff Effect to identify Axions as an excess on a baseline of measured power inside a vacuum sealed, shielded cavity. A combination of dipole electro- and permanent magnets inside the cavity create a field of approximately .5 tesla and a 6cm lead wall partitions it. The signal, which has been optimized by Q factor to a frequency of 413.982 MHz, is sent through up to 150W of amplification before being broadcast and detected by an antenna on the far side of the cavity. The signal, as such, is integrated on a kHz time scale and amplified by a series of SR-510 lock in- and SR-550 pre amplifiers. The DAQ system, created using DASYLab, records the voltage at a kHz rate in coincidence with the maximum value of integration. The current focus of the collaboration is optimizing crucial parameters of the experiment in order to begin data collection and creating appropriate models to simulate and analyze the data.

[1]Prajwal Mohanmurthy*, Ben Ardahl, Dipangkar Dutta, Nicholas Fowler, Mikhail Gaerlan, Mark A. Novotny, Adam Powers, Amy Ray, David Reed, Robertsen Riehle, Gautam Rupak, Mitra Shabestari, Zachary Windham, Zach Short

John Madsen
Mississippi State Univ

Date submitted: 04 Oct 2013 Electronic form version 1.4