

Harvard ATLAS micromega trigger and readout R+D effort FY 2013

Lead investigator: John Huth

The Harvard group proposes to work with University of Arizona and Brookhaven National Laboratory to develop electronics for the readout, control, and trigger of the micromegas chambers under development for the New Small Wheel upgrade of the ATLAS detector. The first phase of this work, to be carried out in FY2013, is the development the overall system design and architecture. This will be followed by construction of hardware as additional funding becomes available. The current proposed work will be heavily reliant on physics requirements input and simulation effort from the NSW group as a whole and from simulation work going on at Harvard as described below. In electronics, our specific interest will be in development of trigger hardware, but we intend to contribute as requested to other parts of the system, namely Front End Electronics and Readout.

The work will be carried out by electrical engineers at Harvard as follows

Personnel	Level of effort	Cost
John Oliver	0.1FTE	\$17,400
Nathan Felt	0.1FTE	\$10,600
Engineers travel – CERN & BNL		\$6,000
Total		\$35,000

Note the above figures include salary and fringe benefits. The work will be carried out by LPPC which is a “service center” at Harvard and incurs no overhead. To carry out the above program, we request funding at the level of **\$35,000** for **FY2013**

As part of the electronics effort, two students are working on the details of the readout and trigger using Athena generated hits in the micromegas. At present, they are using a generic digitization scheme, but as time goes on, and a more detailed digitization is available, they will incorporate this into their studies. The aim is to look at the rate of vectors and fakes in the micro-megas in the new small wheel and ultimately the trigger resolution under realistic conditions. This work is being done in conjunction with the design effort.

Students	Level of effort	Cost
Dany Jradi	0.25FTE through Feb then over summer	\$0
Stephen Chan	0.50FTE summer 2013	\$0