HASP LSU Directional Cherenkov Detector
February 2012 Status Report

Activities

Progress has been made on the simulation program intended to simulate the detector performance. The detector geometry has successfully been implemented into the program structure. The detector was subdivided into smaller sub-detector configurations, which include all of the relevant detector components. These configurations were written to files, which are included in the main program. In addition to the detector geometry, the program requires information on the materials being assembled. This data is used to predict the energy loss and trajectory of particles traveling through the payload structure and simulate signals in detector subsystems. Unfortunately, the selection of materials provided by the program is inadequate for our needs, and an accurate representation of the detector elements is not possible with the current program setup. New files including data on these missing materials need to be generated, in order to accurately model the detector's performance. The program includes a process for adding new materials. However, this process requires a set of inputted reference data on the material's physical properties. Over the next week, the plan is to compile this required data into an appropriate file format using a template provided in software documentation. This allows the program to generate new material files that are referenced in the detector simulation configuration files. Simulation of particle events of different energies and trajectories through the detector should commence shortly after the material files are completed.

Next months activities will also include continuing the construction of the previous HASP payload. Problems with the PMT system continue to persist. The boards controlling the power and signal interface to each of the PMTs need to be replaced. We are in the process of investigating new designs for these boards. One of the board designs being investigated was used in a previous experiment and has proven its effectiveness. Next month's activities will include fabricating and testing this new board design. Electrical potting and vacuum testing will commence shortly after successful testing of this new design. Upon completion of the PMT system, the detector optical components require optical bonds. The optical bonding compound requires multiple days of dead time for curing. During this dead time, the planned activities include the further fabrication of parts needed for the mechanical structure and further testing of the flight software and electronics.

Team Management Structure

Team Electron Volt is comprised of Sean McNeil. Contact information and individual roles are shown in Table 1.

Table 1 – Team Management Structure

Name	Sean McNeil	Dr. Gregory T. Guzik
Roles	• Software • Testing • Calibrations • Data Analysis • Project Management • Electrical • Mechanical	• Faculty Advisor
Department	LSU Physics and Astronomy	LSU Physics and Astronomy
Contact Information	smcnei2@tigers.lsu.edu (209) 202-8522	guzik@phunds.phys.lsu.edu (225) 578-8597