**LBNE October 2014 Quarterly Report**

1. Revised FGT STT Design

Figure 1 shows a schematic drawing of the revised straw tube tracker (STT) design, where the neutrino beam enters from the left. The STT consists of 80 modules, where each module has 4 layers of straw tubes (XXYY) and either a nuclear target or foil radiators for transition radiation production. The upstream 34 modules will contain a nuclear target, while the downstream 46 modules will include foil radiators. Nuclear targets that will be used include carbon, calcium, water, deuterated water, and tubes of pressurized argon gas. For the modules with radiators, 34 foil radiators will be located at each end of the module, and 75 foil radiators will be positioned in the middle of the module between the XX and YY straw tube layers. Each module is 8 cm thick, and the total STT thickness is 6.4 m.

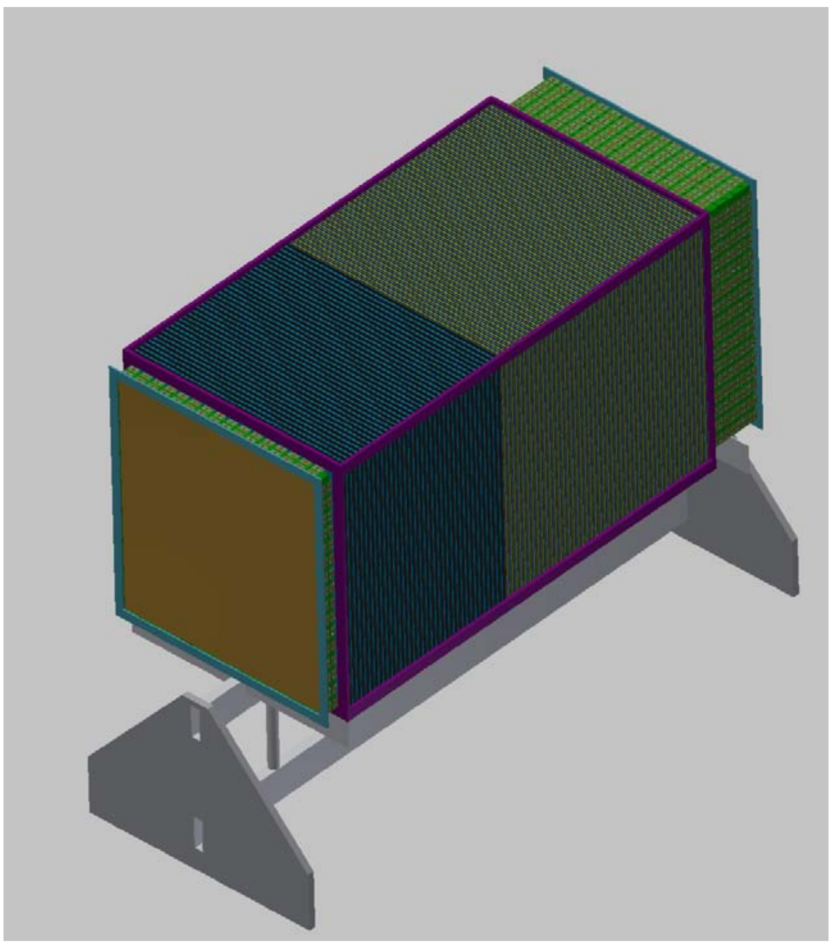

*Figure 1: A schematic drawing of the revised STT design. The neutrino beam enters from the left. The upstream and downstream ECAL modules (green) are also shown in the drawing.*

2. Shipping Issues for the 4m x 4m Downstream ECAL

Studies have been performed on the shipment of the 4m x 4m downstream Electromagnetic Calorimeter (ECAL) from India to Fermilab, and there are several shipping issues. First, as shown in Figure 2, a special cart will be needed to raise the detector from the assembly platform and then to rotate it by 90°. Second, as shown in Figure 3, the door of the ECAL factory will need to be enlarged in order to get the ECAL out of the building. Third, we would need a custom double high shipping container and a non-standard handling procedure to successfully load our container onto the train from Guwahati to Kolkata; however, this service does not currently exist. Fourth, we will need special arrangements at both sea ports to load and unload our container, and it is unknown if double height shipping service is available between a USA sea port and Fermilab. Finally, shipment in the USA by road will likely require the removal of the ECAL with its special shipping fixture from the custom, shipping container. The detector would also need to rotate 90° to allow adequate clearance below bridges. Due to these issues, it may be preferable to ship 2m x 4m sub-modules and to complete the assembly at Fermilab.

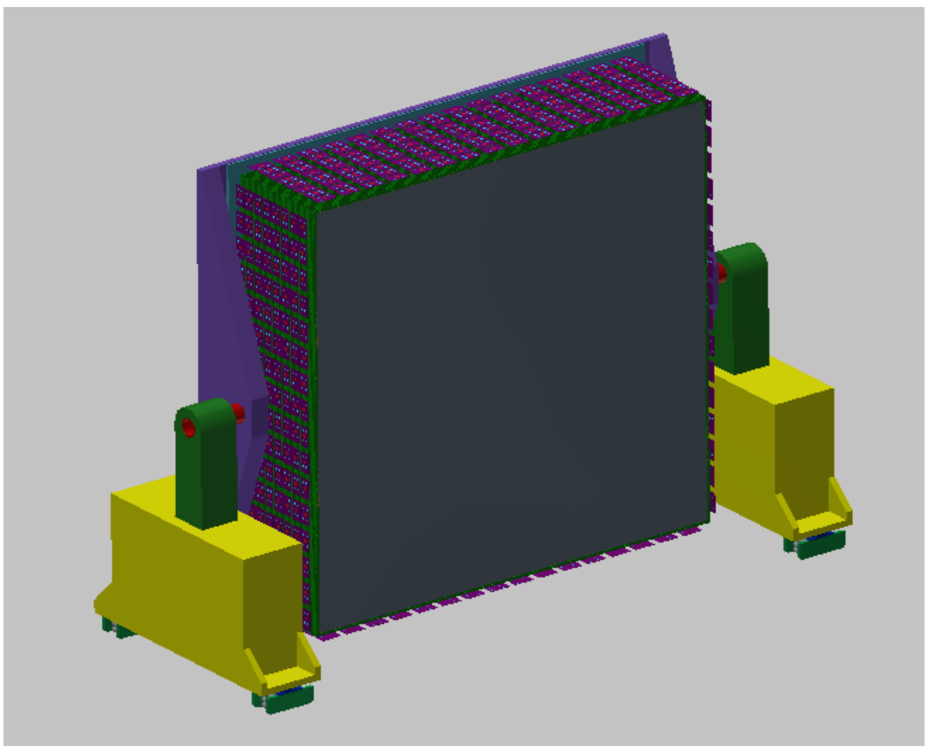

*Figure 2: A schematic drawing of the special cart needed for moving the 4m x 4m downstream ECAL.*

*Figure 3: A schematic drawing of the ECAL factory layout. A larger door will be required to get a 4m x 4m downstream ECAL out of the building.*

3. STT Electronics Readout

A design of the Straw-Tube Tracker (STT) electronics readout is shown in Figure 4. There are wire connections from the straw-tube pins to the 32-channel I/O board, and a connector between the I/O board and the 32-channel Resistor/Capacitor (RC) board. (Note that the RC board needs to make a gas seal.) Finally, a Preamp/ADC/Readout card is then connected to the RC board.

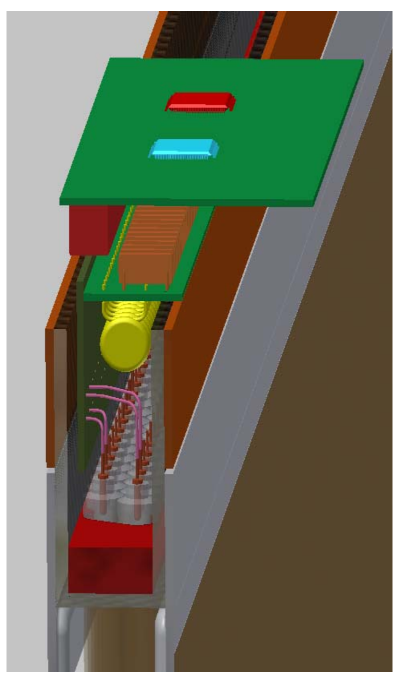

*Figure 4: A schematic drawing of the STT electronics readout.*

4. Modified Layout of Cherenkov Detector in NuMI Alcove 1

Using a tape measure, a 1.3 m error was discovered in the available space in NuMI alcove 1, just downstream of the NuMI absorber, and a laser scan of alcove 1 confirmed the tape measurement. Figure 5 shows a modified layout of the NuMI absorber and the Cherenkov detector in alcove 1.

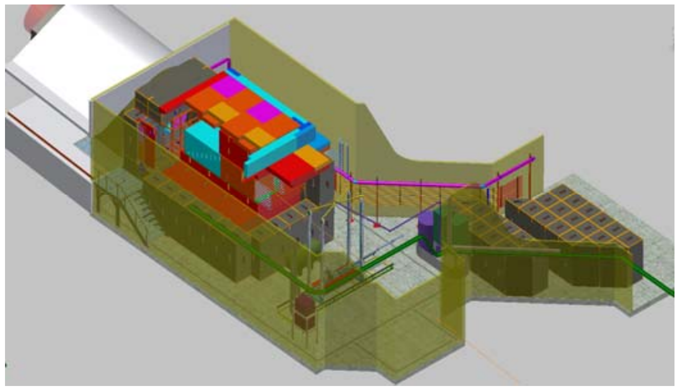

*Figure 5: A modified layout of the NuMI absorber and the Cherenkov detector in alcove 1.*

5. Revised Stopped Muon Detector Design

A revised design has been completed for the stopped muon detector in the NuMI alcoves. Figure 6 shows a schematic drawing of the muon detector, which consists of inner and outer volumes filled with oil and read out by separate photomultiplier tubes. The oil volumes reside inside a borated-polyethylene enclosure that is 28" in diameter and 42" high.

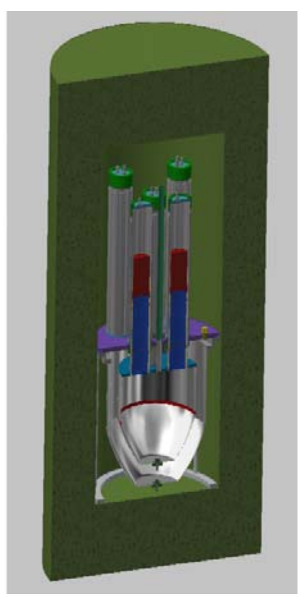

*Figure 6: A schematic drawing of the revised stopped muon detector design.*