AegIS Scintillating Fiber Detector

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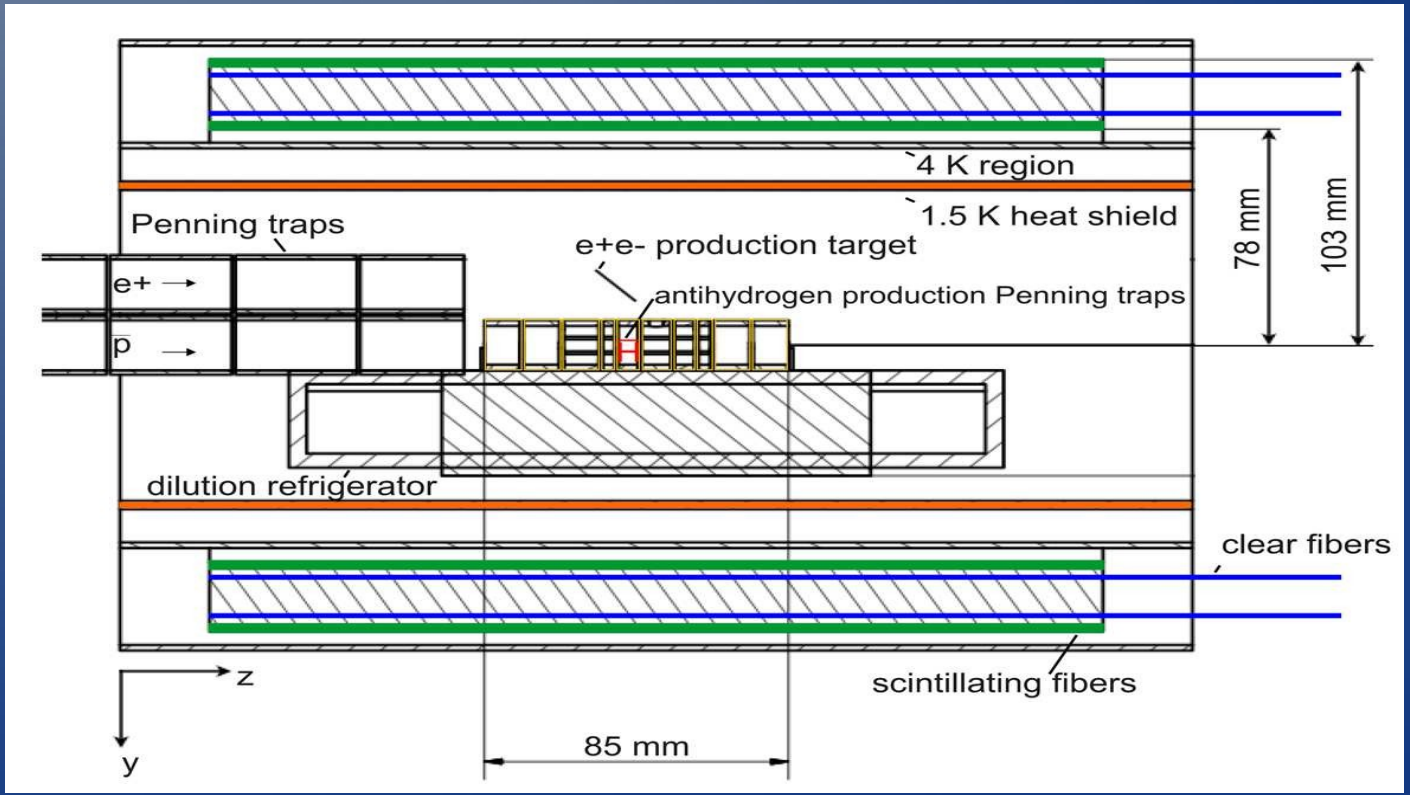
AegIS Recap

- Primary measurement is the gravitational acceleration of antihydrogen
- Also intends to perform spectroscopy measurements

Scintillating Fiber Detector

- Used to determine where in the trap antihydrogen is annihilating
- two layers of fiber for vertex reconstruction



My Contributions

- Created setup for testing the transmission efficiency of fiber interfaces
- Programmed an interface for a digitizer reading the PMT output of the fiber detector
- Machined a holder for the fiber for when the fiber is polished

Fiber Transmission Testing

- A darkbox containing an LED, temperature sensor, and photodiode

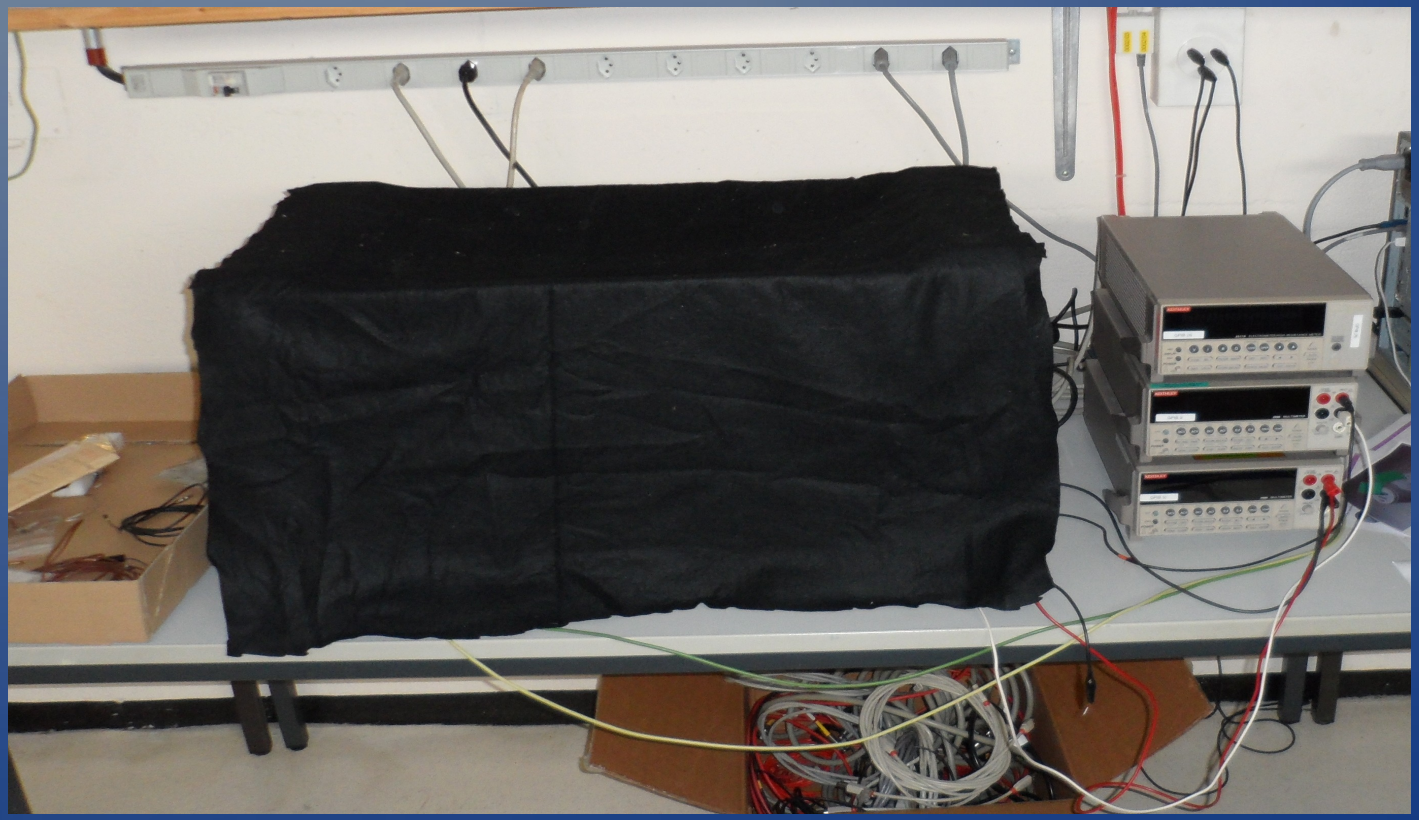


Fig 1
The darkbox designed for testing the transmission efficiency of the fiber optic connections

Digitizer

- The digitizer is controlled using a C program and libraries provided by the manufacturer

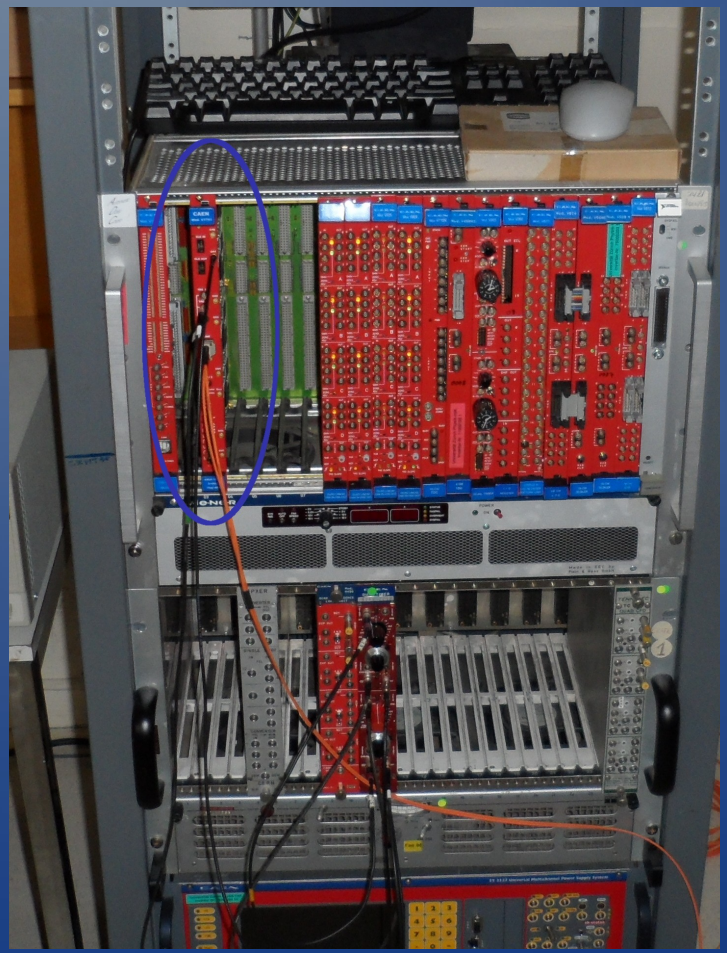


Fig 2
A CAEN 1751 digitizer(circled) in a VME crate

Fiber Holder

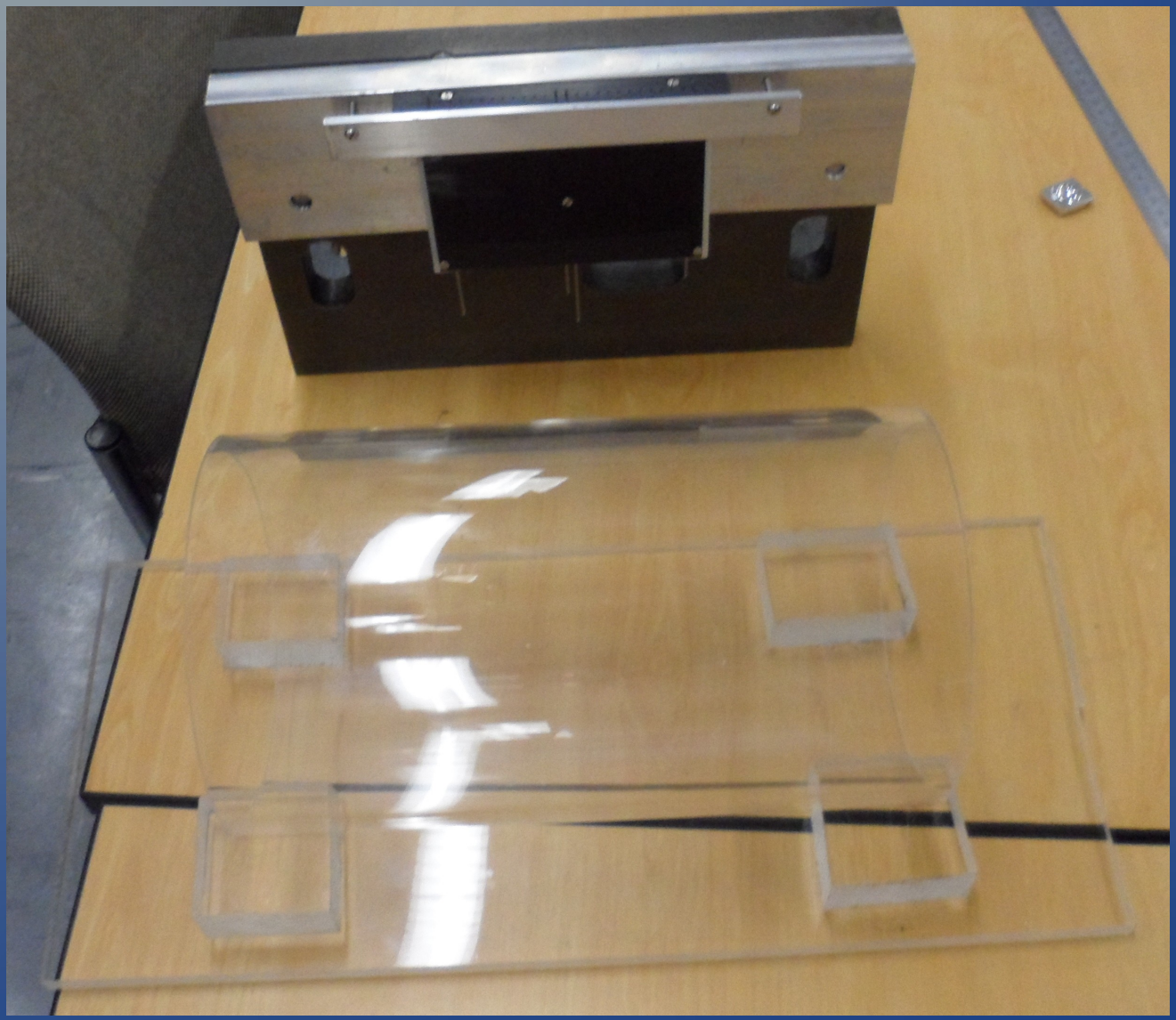


Fig 3
The equipment constructed to hold the fiber optics while they are polished and machined

Fiber Holder(cont.)

- Holds the fiber while the ends are polished by a diamond bit in a high speed CNC machine
- The clear plastic component holds the other end of the fiber during this process

What is Next

- Test run of the fiber polishing
- Scale up the design of the fiber holder for more fibers
- Put the fibers into the final connector when it arrives and test the transmission efficiency
- Modify fiber connections to optimize transmission efficiency of the connector if necessary

Questions?