

Fiber Polishing at JLab and Other Experiments

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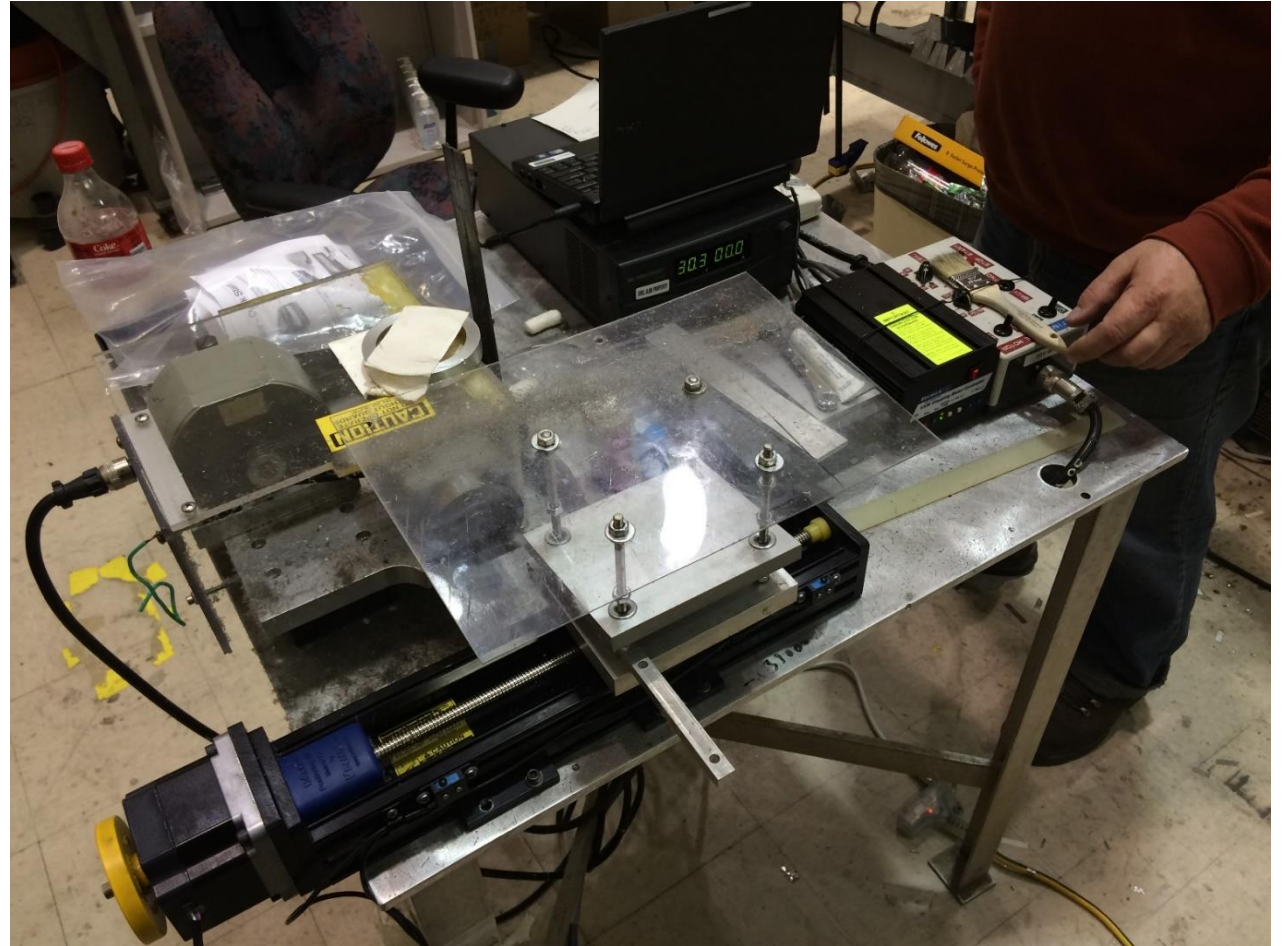
Shandong University

Polishing Set in JLab

In HallA lab now,
borrowed from HallB

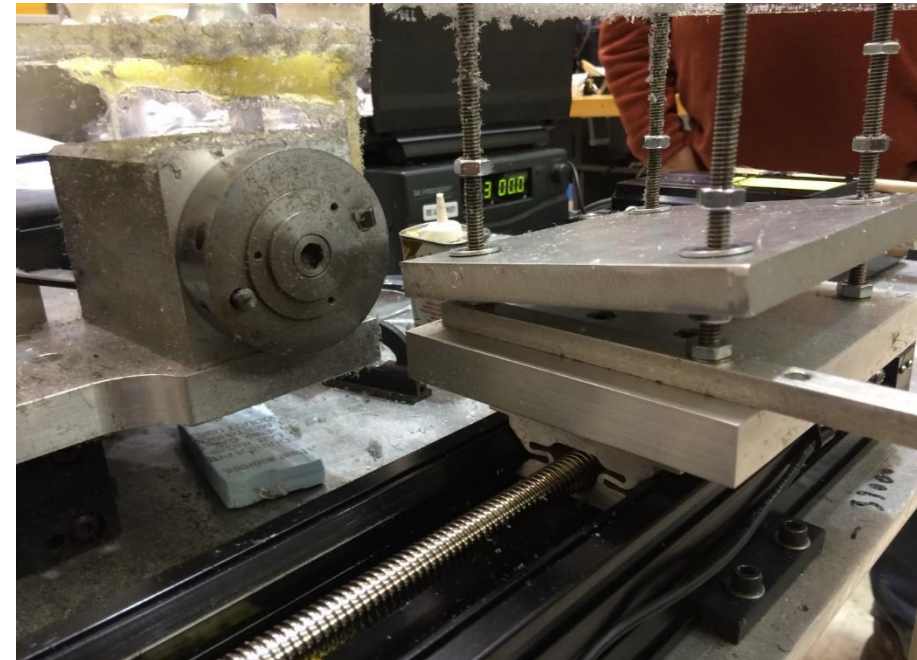
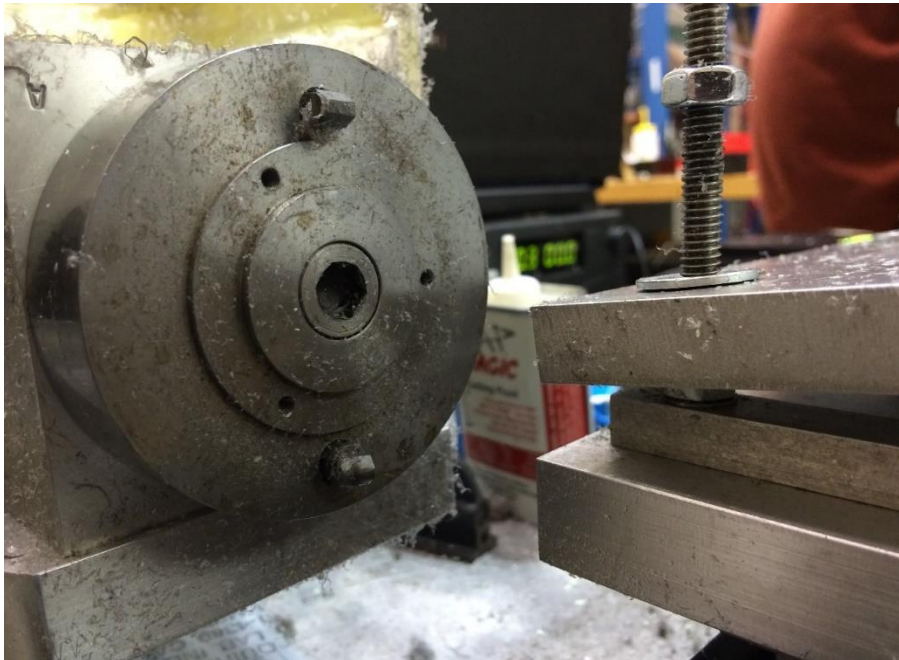
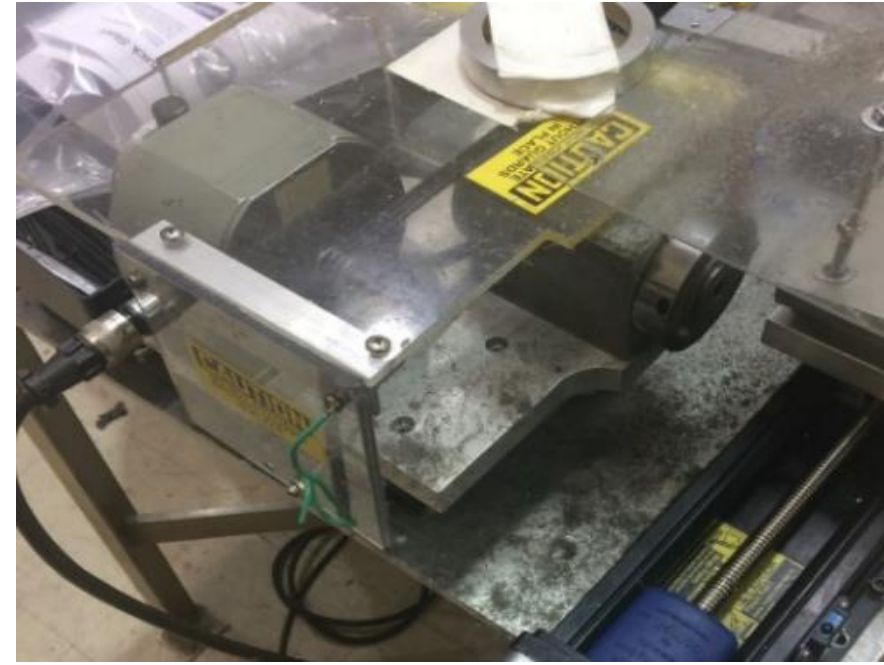
Including:

- Polishing machine
- Guide rail
- Motor controller
- Power supply
- Controlling computer



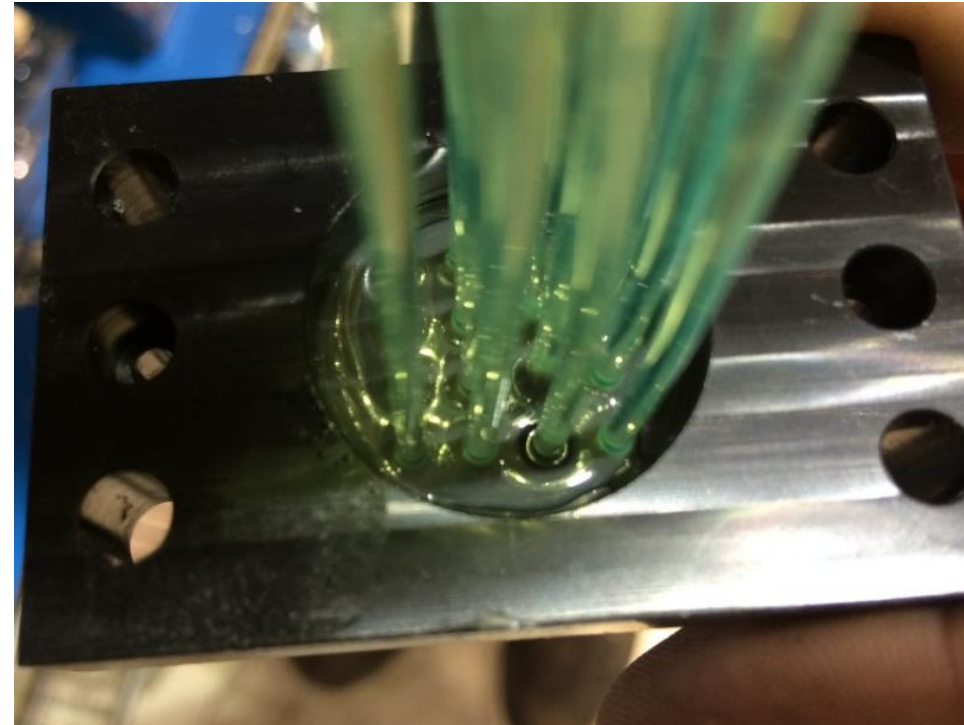
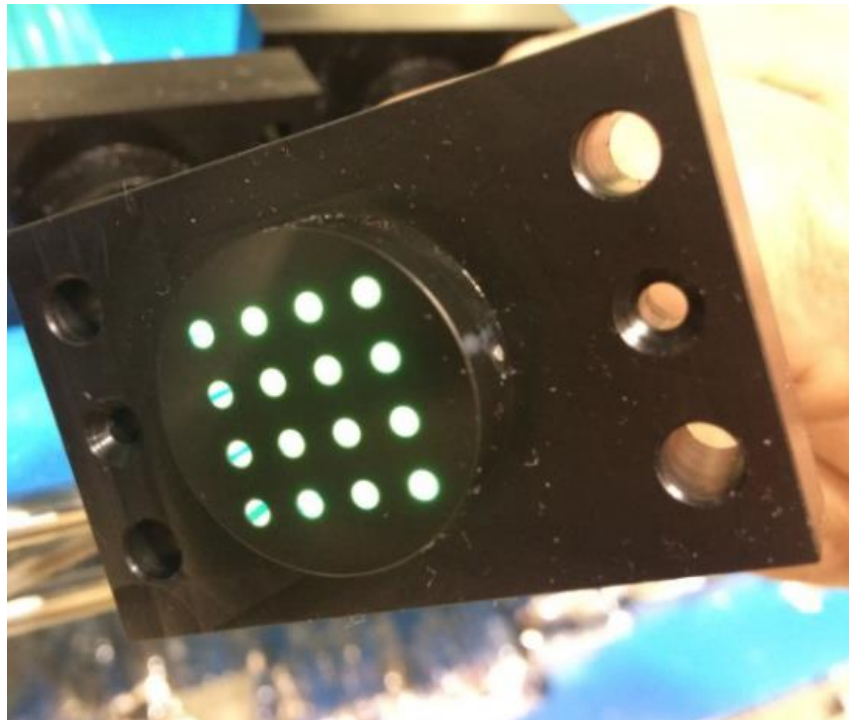
Polishing Machine Structure

- Motor drive belt pulley to make blade rotating
- Two type of blade: Steel and Diamond (Maybe use steel firstly then diamond)
- Use splint to fix fiber kit
- Sliding rail realize two dimension polishing



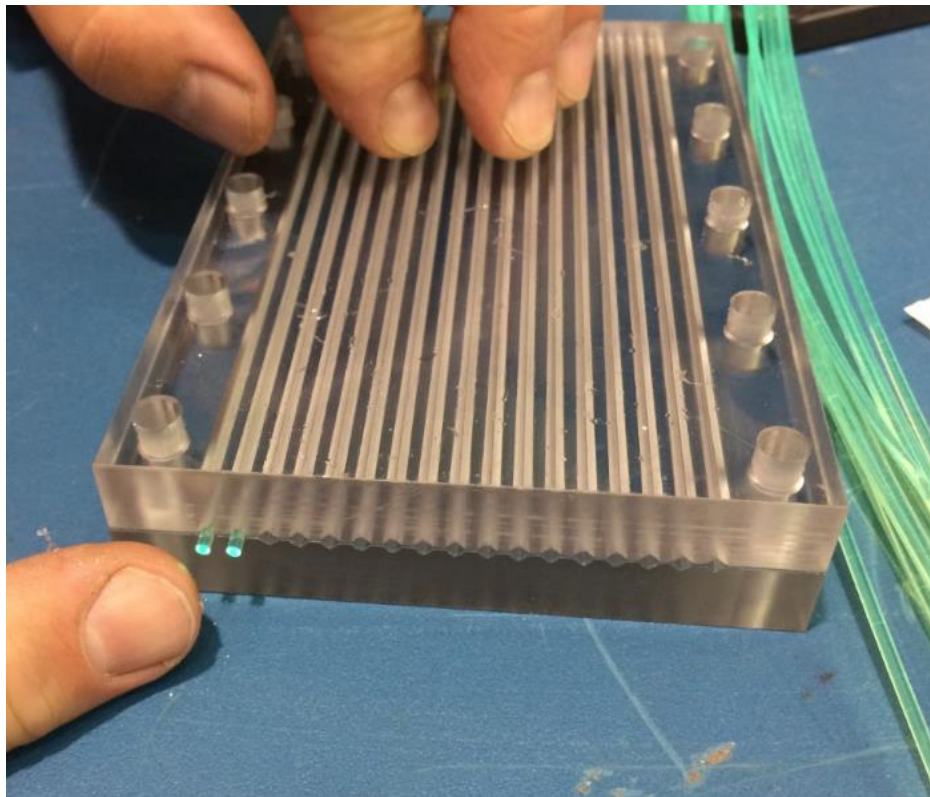
The side coupled to MAPMT(16-multi-anode)

- Perfect polishing quality
- 16 * $\Phi 2\text{mm}$ fibers, glued to the kit
- Polish several times, the whole time may 20 minutes for one kit



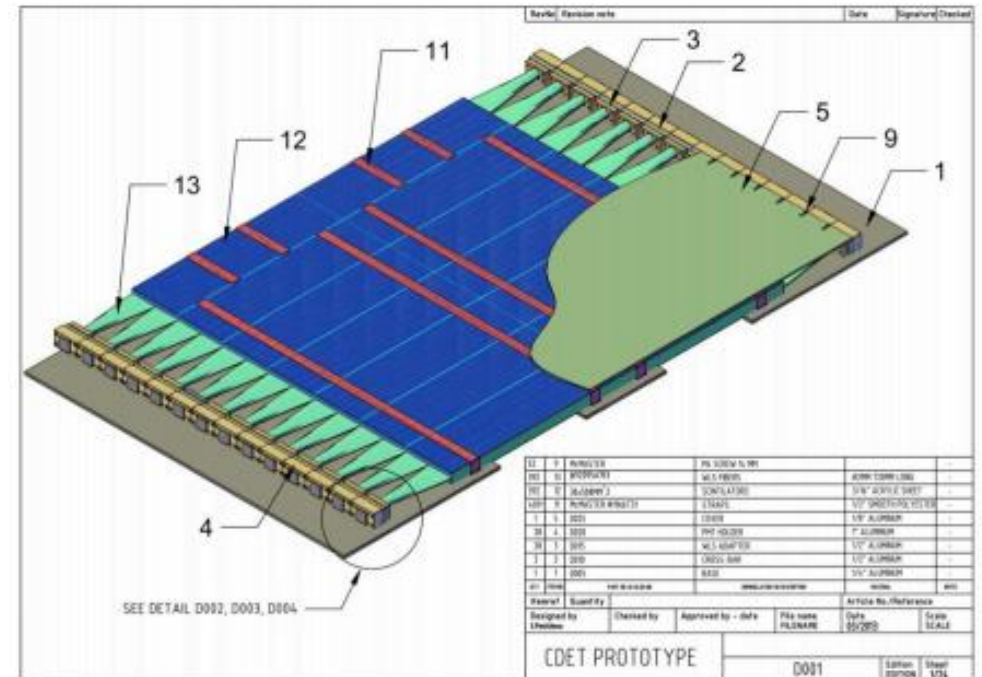
The other separated side

- Use a long plastic holder to fix fiber(very clever method)
- Use aluminium reflector film to reflect light(maybe could reach 70%)



The Detector in Hall A

- SuperBigbite Spectrometer (SBS) project in HallA
- PMT-based Coordinate Detector(Both for time and position measurement)
- The distribution of fibers in scintillator is just like in plastic holder



Deal with fiber in other experiment

For Polishing machine

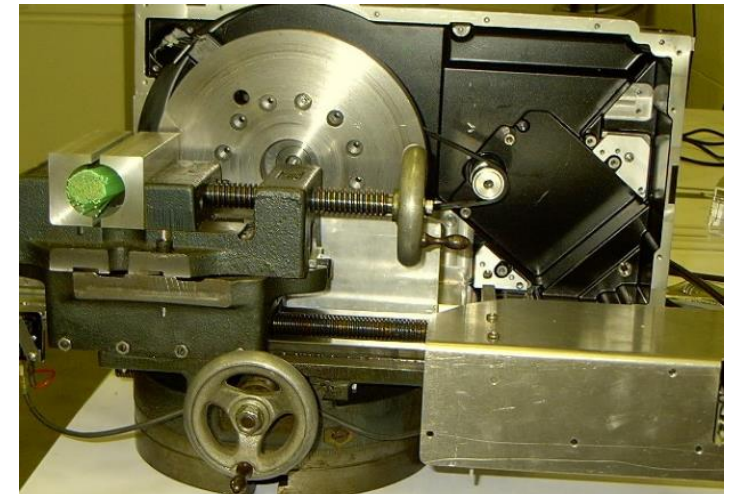
- Similar device for ALICE and ATLAS Tilecal
- Both use diamond for finish polishing
- The device could used for cutting and polishing
- Not simple as seems like

For dealing with fiber bundle

- Alice group use freeze technique to polish fiber bundle (freeze with water at -20°)



ATLAS Tilecal



ALICE