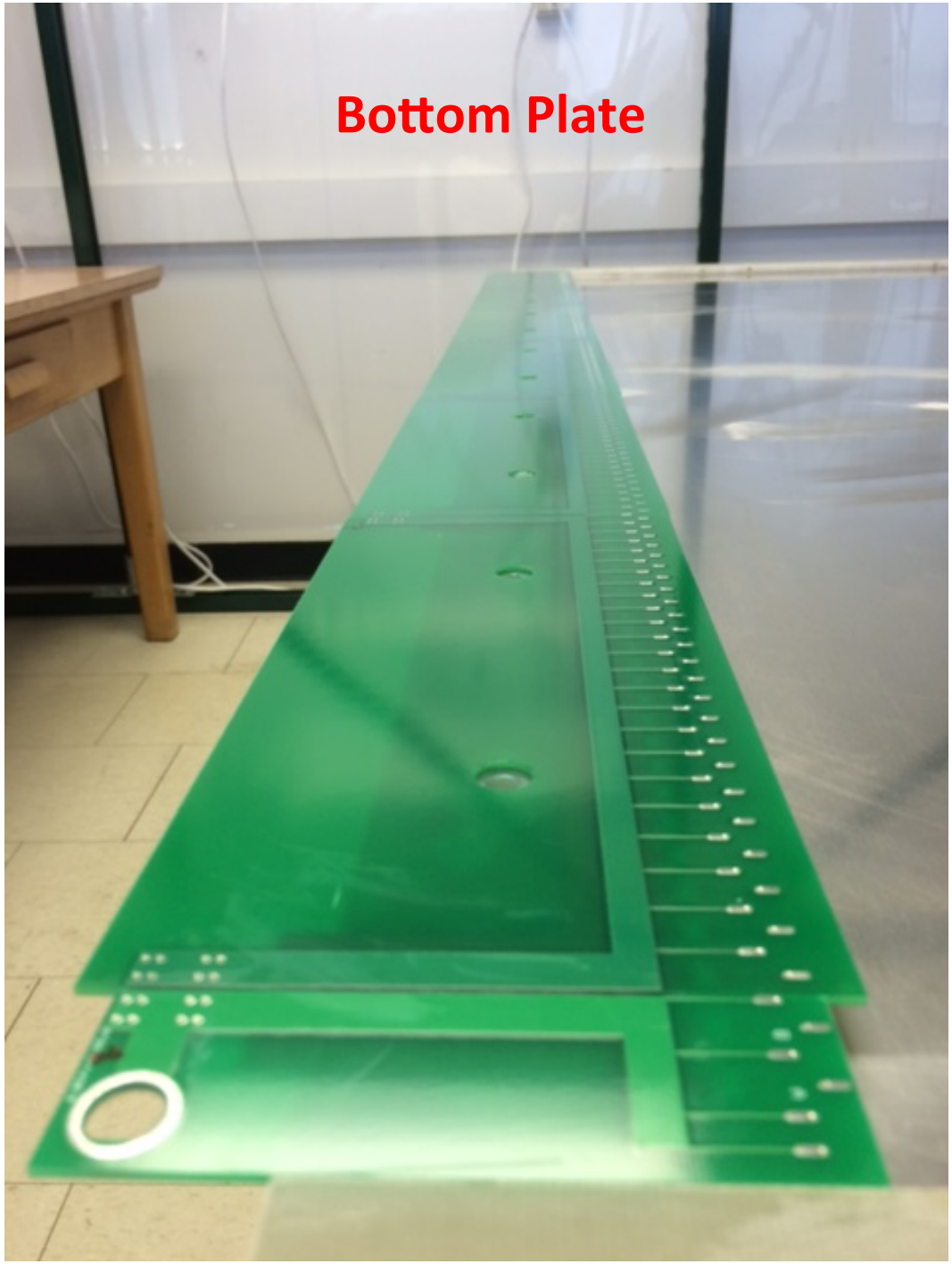
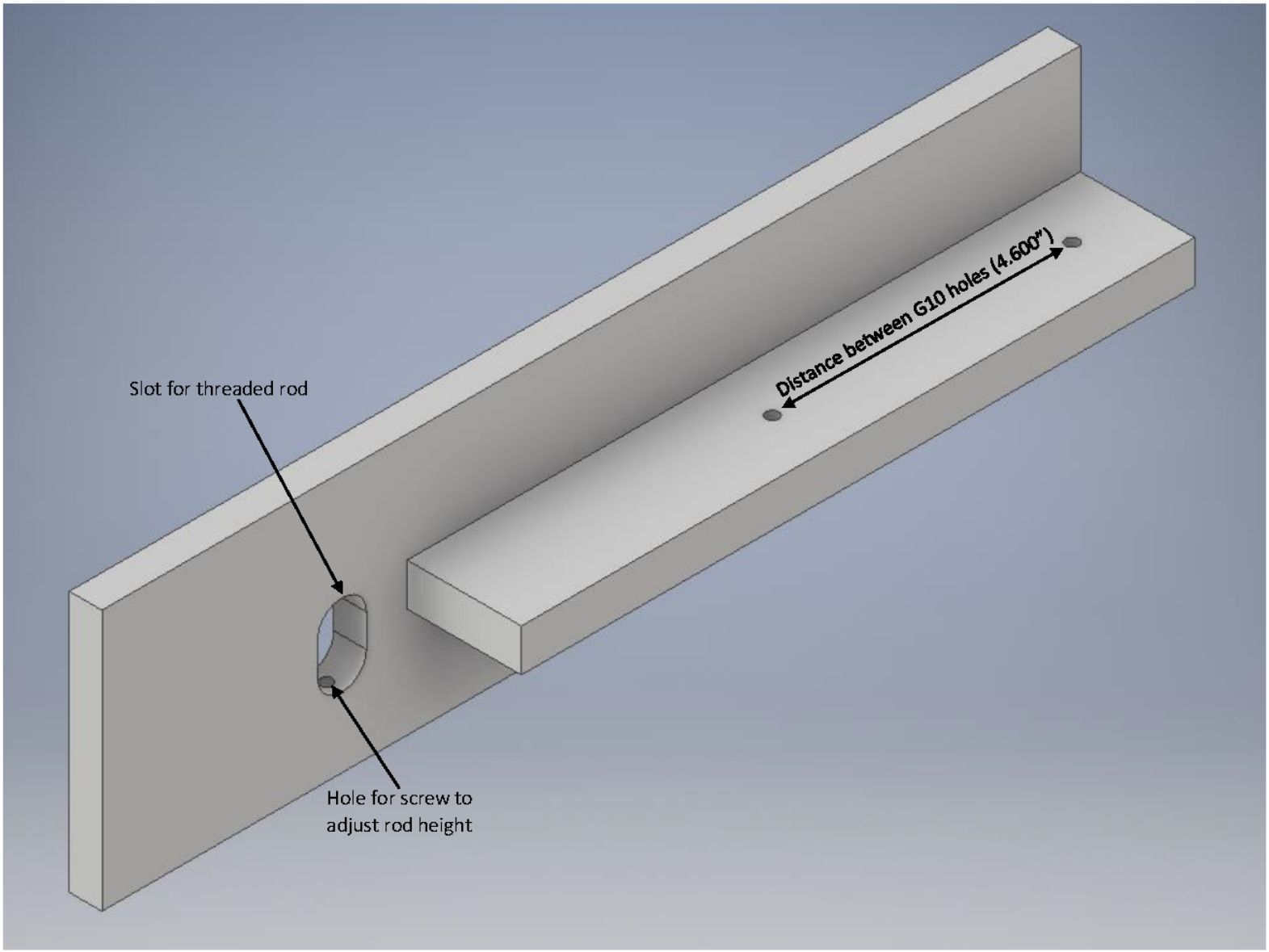
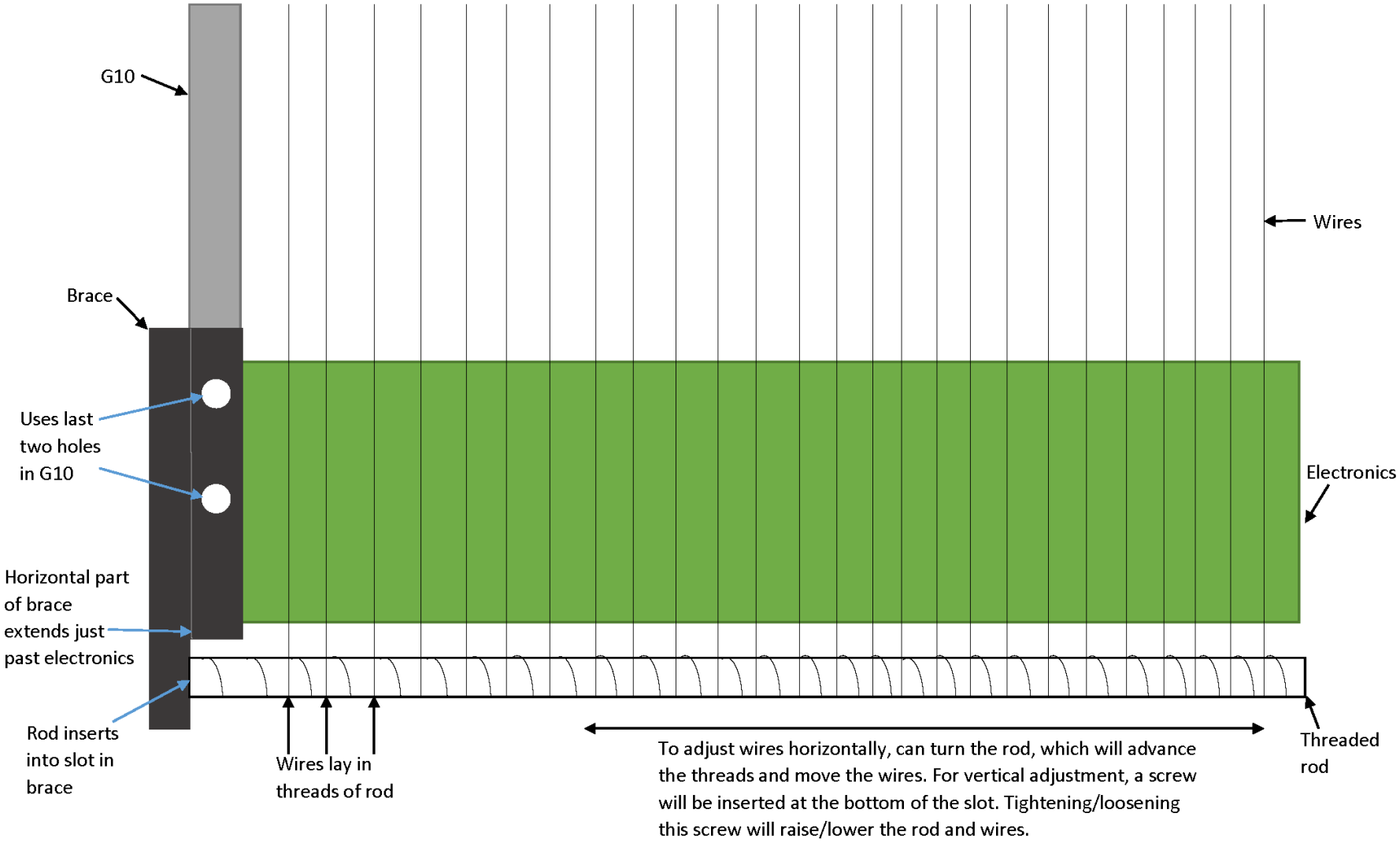
MWPC Construction


Bottom Plate

Top Plate

Wire Stringing


Slot for threaded rod
Distance between G10 holes (4.600")
Hole for screw to
adjust rod height



- Threaded rod is usually manufactured by “rolling”, circular stock is rotated through a die that cuts the threads. Acme threads have the best tolerances, about +/- 9 mil/foot.
- The other process is to grind the threads , cutting away metal. Can achieve accuracies of a few mil over 10’s of feet. Haven’t found any company willing to grind a threaded rod for us.

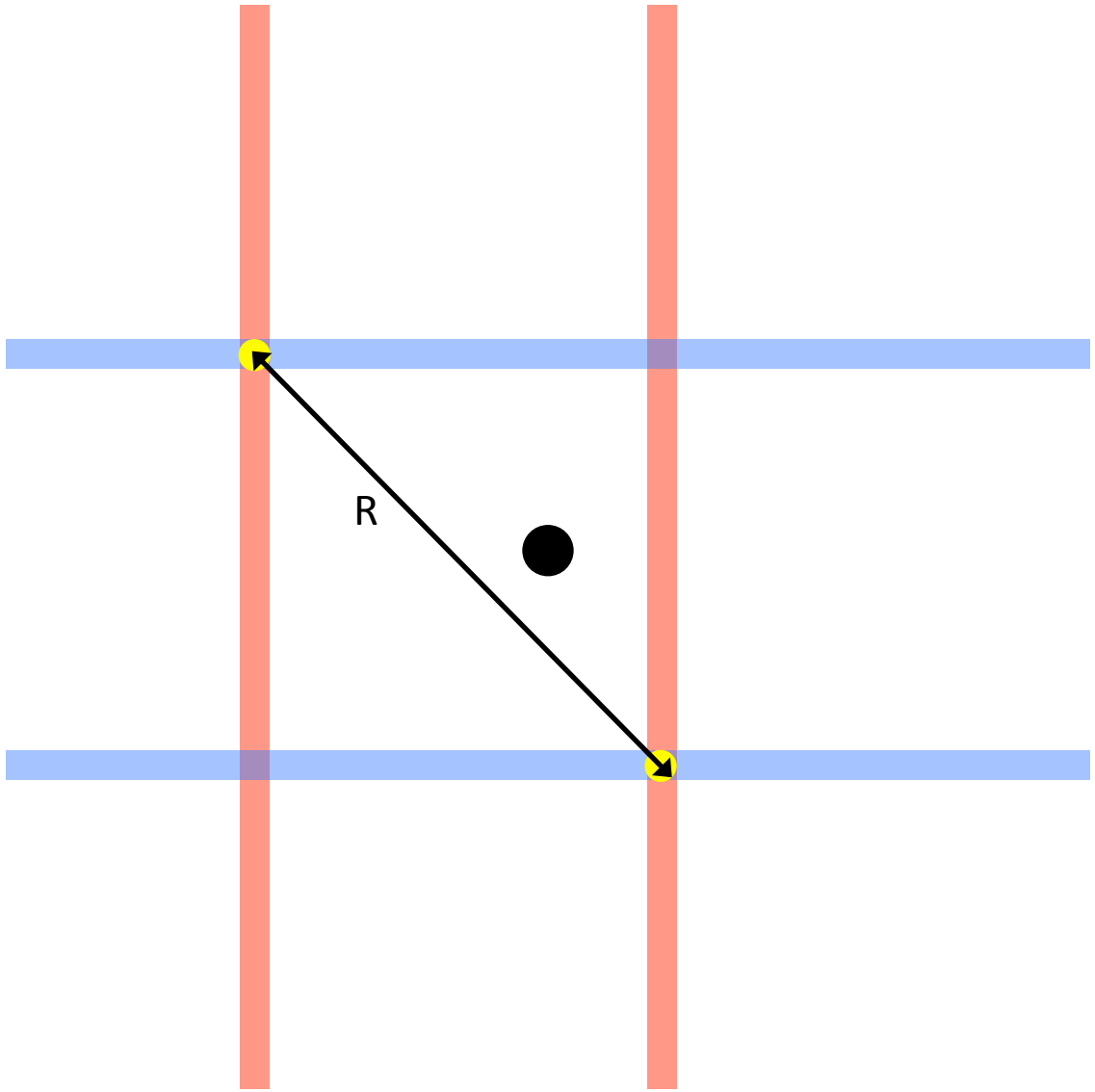
Wire stringing with Acme rod: measured thread precision is about 10 mil over 6 ft

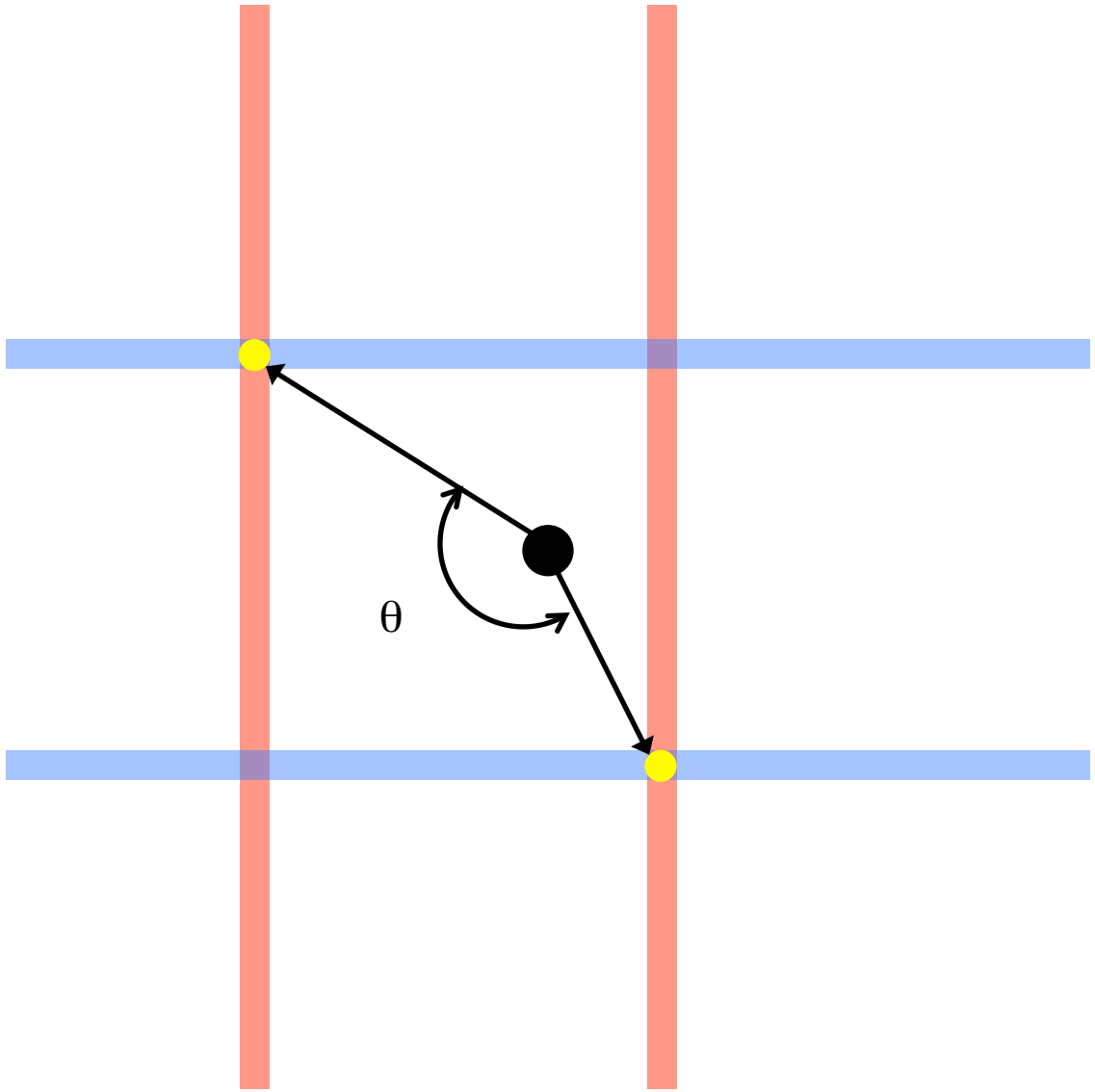
- Because Acme threads have a flat bottom, they're not the best threaded rod to use for wire placement.
- McMaster-Carr sells a class 3 threaded rod that's rolled, with a v-groove. We've ordered this rod and will measure the thread accuracy over 6'

Next Steps:

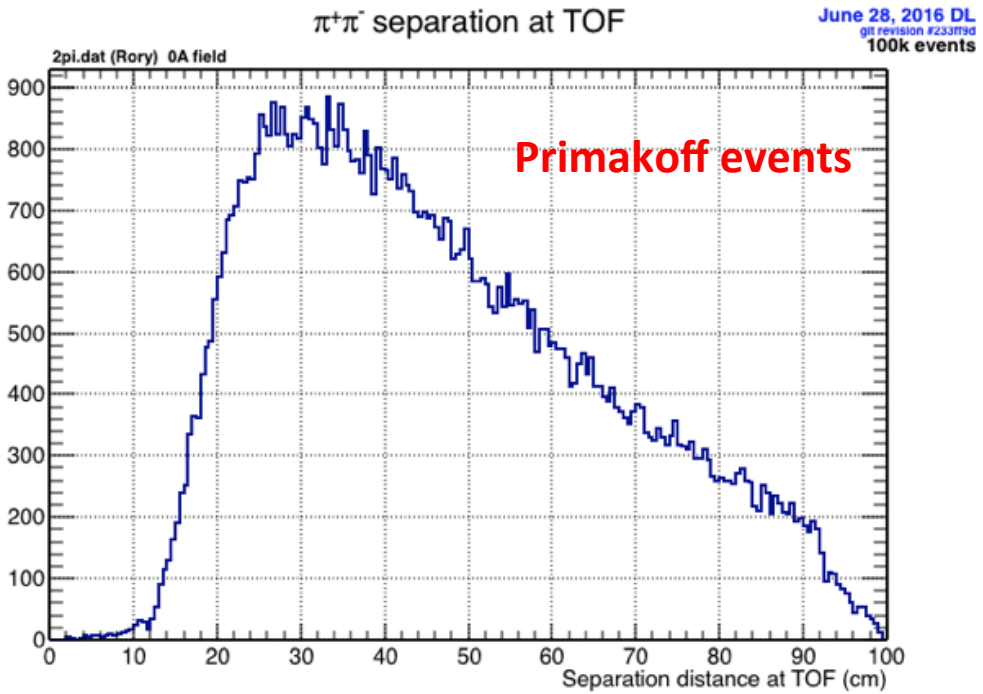
✓ 1. Complete attachment of the HV capacitors onto the amplifier boards (waiting for Bobby to return)
2. Attach preamp boards to bottom aluminum plate
✓ 3. Finish machining O-ring groove into G10 slats (Rick in machine shop)
✓ 4. Attach G10 slats to top aluminum plate
5. Move completed top plate into clean room
6. Make brackets to hold threaded rod for wire stringing
7. String wires
8. Close detector
9. Flip the detector top side down, complete electronics hookup
10. Flow gas, test with HV

Using TOF for Triggering

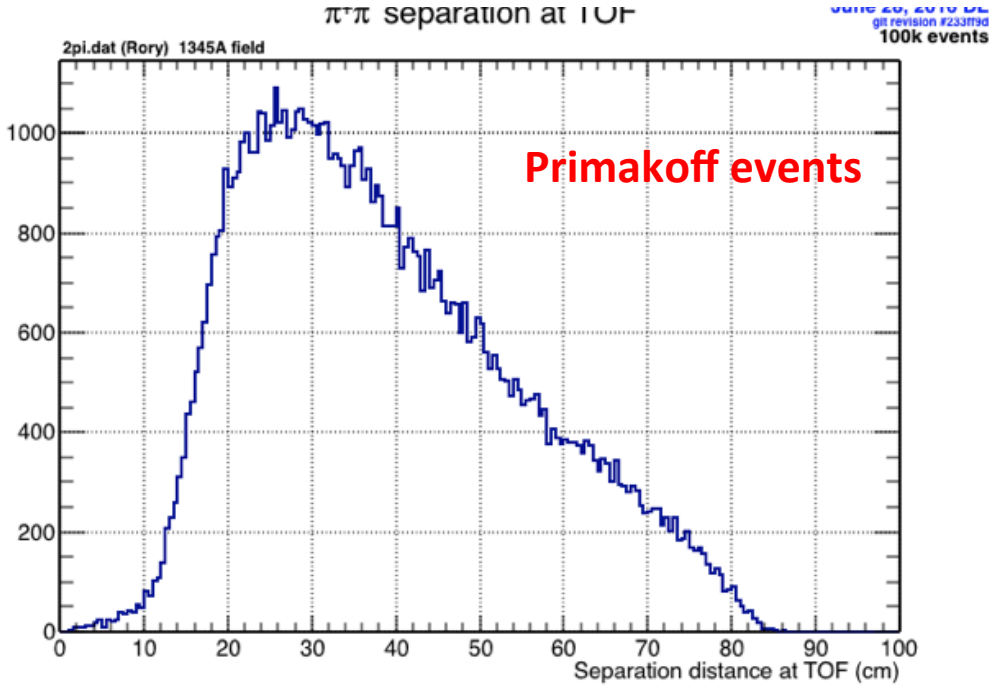

R


θ

0 A


π+π- separation at TOF
June 28, 2016 DL
git revision #233ff9d
100k events
2pi.dat (Rory) 0A field
Primakoff events
Separation distance at TOF (cm)

1345 A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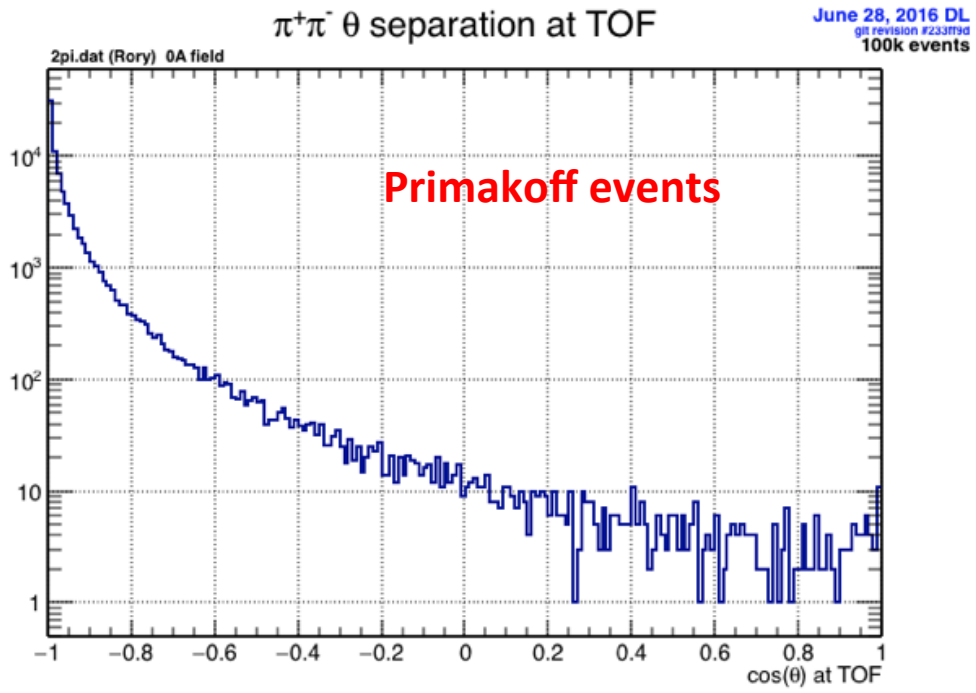
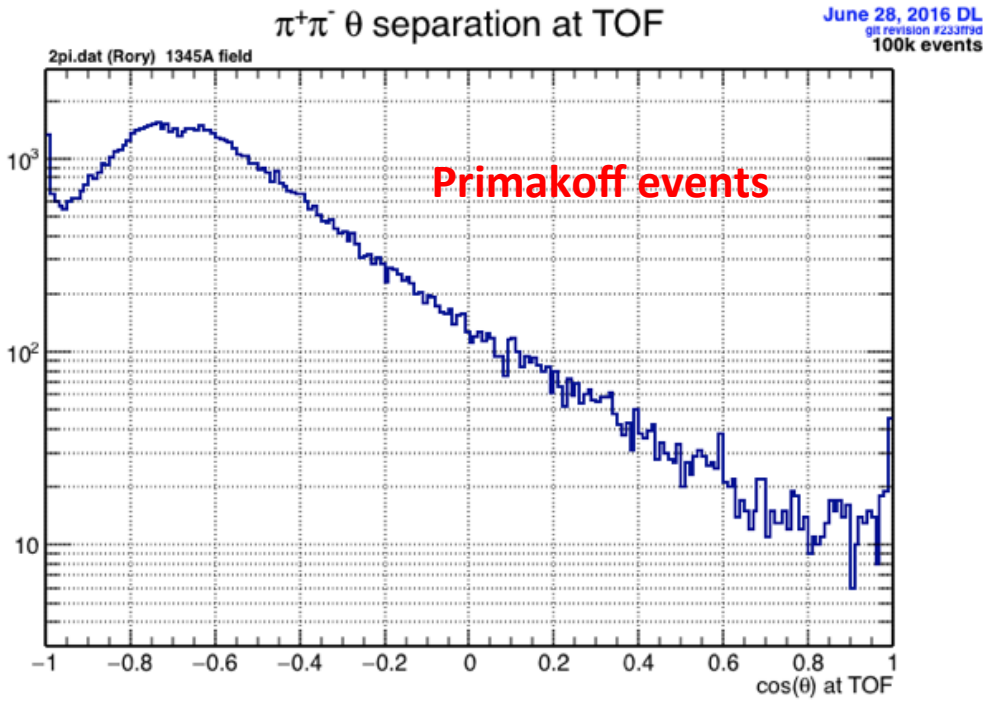
100k events
2pi.dat (Rory) 1345A field
Primakoff events
Separation distance at TOF (cm)

0 A


π⁺π⁻ θ separation at TOF
June 28, 2016 DL
git revision #233ff9d
100k events
2pi.dat (Rory) 0A field
Primakoff events
10⁴
10³
10²
10
1
−1
−0.8
−0.6
−0.4
−0.2
0
0.2
0.4
0.6
0.8
1
cos(θ) at TOF

1345 A


π⁺π⁻ θ separation at TOF
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0.6
0.8
1
cos(θ) at TOF

TOF rates with solenoid on, 3.4 mm collimator

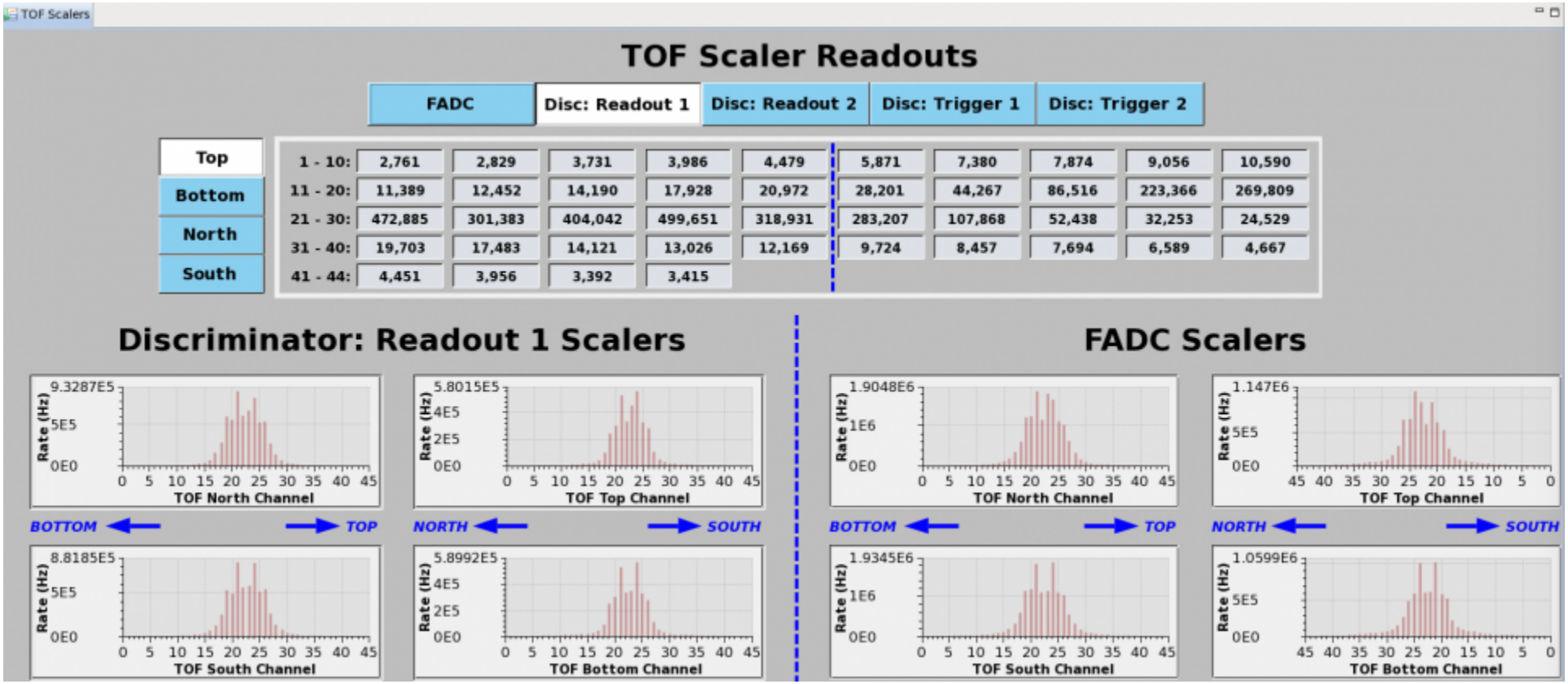
Lognumber 3393177. Submitted by elton on Tue, 03/29/2016 - 08:28.

Logbooks: HDLOG HDTOF

References: 3392794 - TOF rates with solenoid off

Nominal running with amorphous radiator, 3.4 mm collimator, 200 nA beam

TOF scaler rates are about 1 MHz. We need to check the threshold and compare to trigger thresholds.



Minimal trigger condition: 4 bars hit, exclude central bars 22 to 23	**Background Trigger Rate**
No additional requirement	23 kHz
18 cm minimum separation between hits	21 kHz
$\cos\theta < -0.7$	7.0 kHz
All the above	7.0 kHz
$\cos\theta < -0.4$	8.5 kHz
$\cos\theta < 0.0$	12.5 kHz
$-0.9 < \cos\theta < 0.0$	7.5 kHz

Next step is to calculate the trigger efficiency for Primakoff and $\mu^+\mu^-$ pairs using the above cuts:

1. Use xy coordinates at the TOF to find the paddles hit.
2. Calculate (i) separation distance and (ii) opening angle of hits relative to beam axis using paddle positions
3. Calculate trigger efficiency for Primakoff and $\mu^+\mu^-$ pairs