

# Move tagger microscope to cover 6 GeV coherent peak

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- Responsibility: UConn (Richard)
- Alignment tools and hardware
  - An alignment jig must be machined for the new beta-angle
  - Engineering drawings are available and Uconn can order part directly from their 3D model.
- Procedure for moving microscope?
- Schedule for moving (~ week)
- Hodoscope coverage
  - Sparse coverage below 7.2 GeV (12 GeV beam)
  - Is it possible to have both microscope and hodoscope coverage at 6 GeV?
  - Note that coverage between 8.1-9.1 GeV will be missing.
  - Software to reconstruct photon energy and flux needs to be updated
- Alignment of diamond to 6 GeV during commissioning. Gap in spectrum at location of microscope?

# Geometry of Tagger

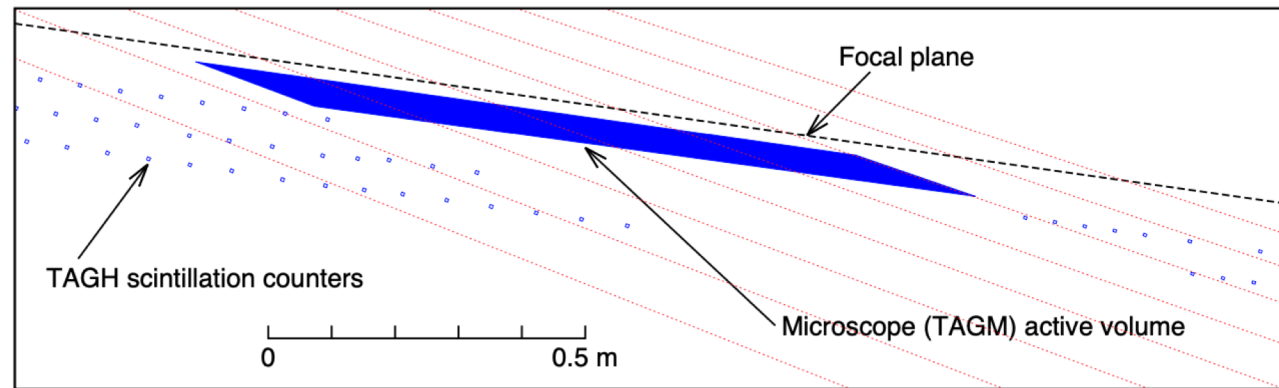
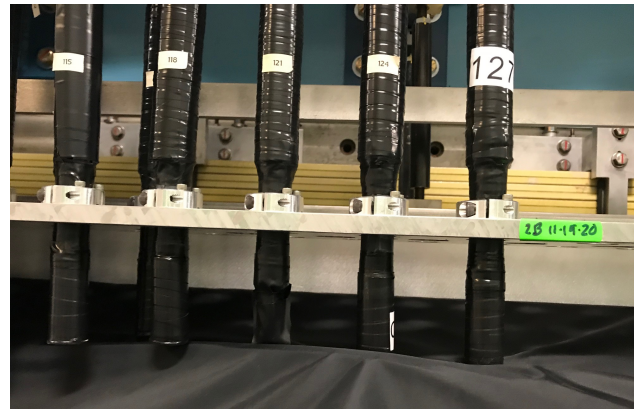
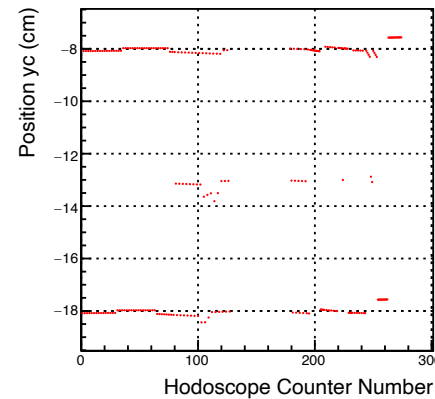
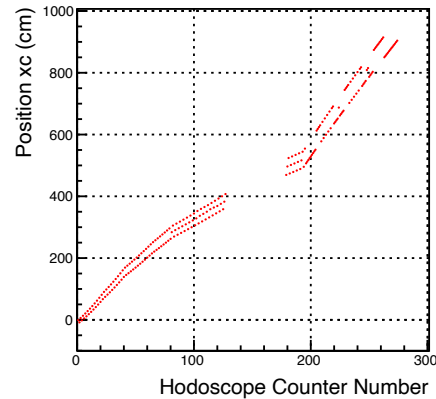
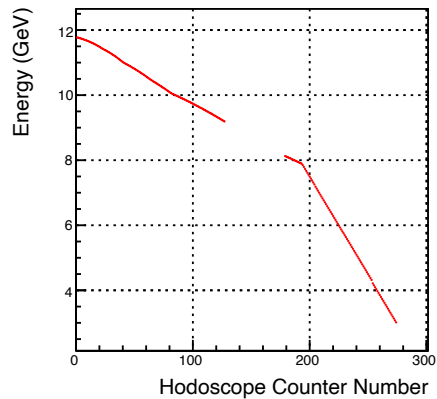


Figure 10: Schematic of electron trajectories in the region of the microscope. Shown are the three layers of hodoscope counters on either side of the microscope and the region covered by the microscope.

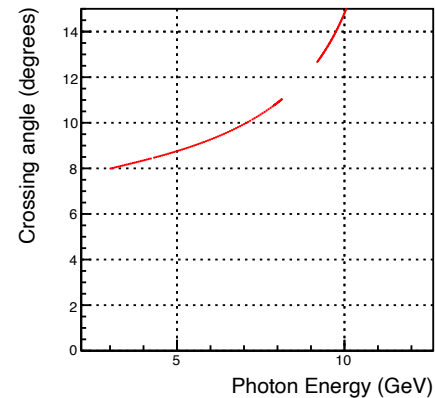
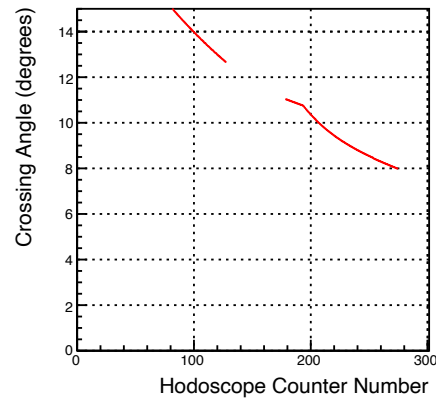
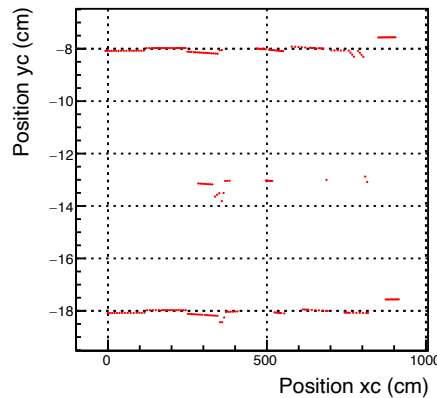


# Energy, position and crossing angle of hodoscope counters



Microscope transverse size  
 $= 17 \times 6 \times 0.2 \text{ cm} = 20.4 \text{ cm}$

Length at 8.8 GeV  
 $= 20.4 \text{ cm} / \sin(12^\circ) = 98 \text{ cm}$   
 $\Delta E \sim 8.2 - 9.2 \text{ GeV}$



Length at 6 GeV  
 $= 20.4 \text{ cm} / \sin(9.2^\circ) = 130 \text{ cm}$   
 $\Delta E \sim 4.8 - 6.3 \text{ GeV}$

## Presentation from Dan Sober

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(Parenthetically)

New (Spring 2017) survey of **Microscope position (Upstream Center)**

Zroom, Xroom = 7.41009 m, -1.16666 m      Angle = -8.05220°

In new coordinates (including magnet center shift) microscope is at

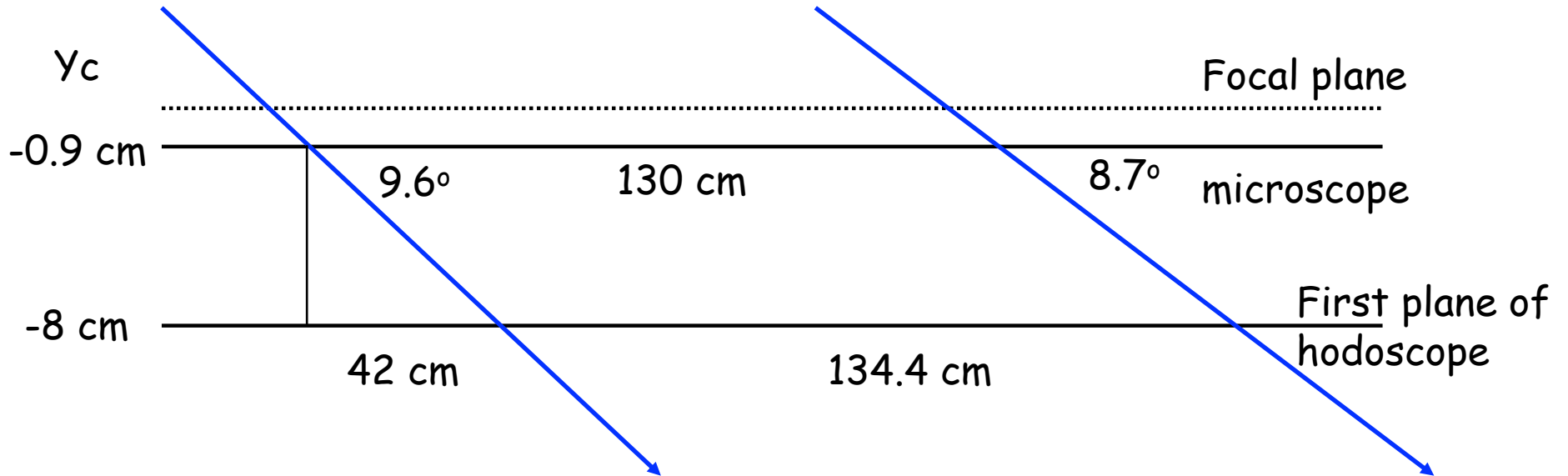
xmap, ymap = 73.488 cm, 122.645 cm

xFP, yFP = 331.245 cm, -0.932 cm

Change in angle is negligible.

<https://halldweb.jlab.org/wiki/images/e/e0/TaggerHodoscopeEnergy-1-2017.pdf>

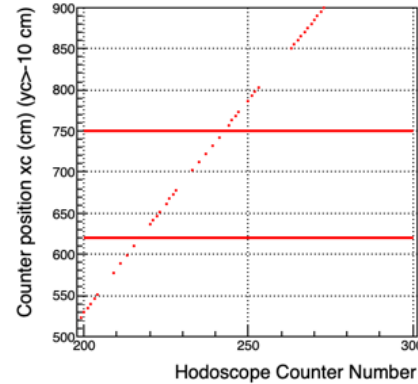
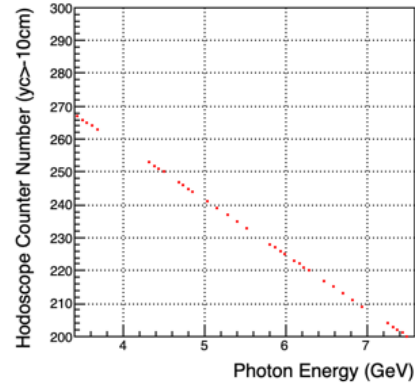
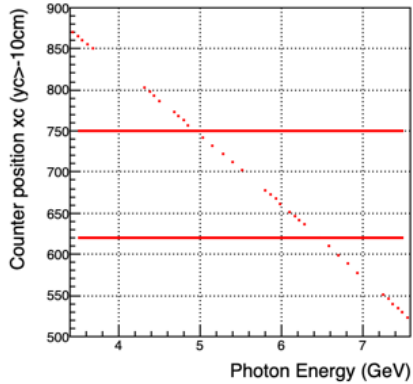
# Microscope relative to Hodoscope



Microscope is about 42 cm upstream of first plane of hodoscope

Not to scale

# Energy scale taken from first hodoscope plane



Size of microscope  
Covers ~ 1.5 GeV

