

Update on  
Step IV Analysis

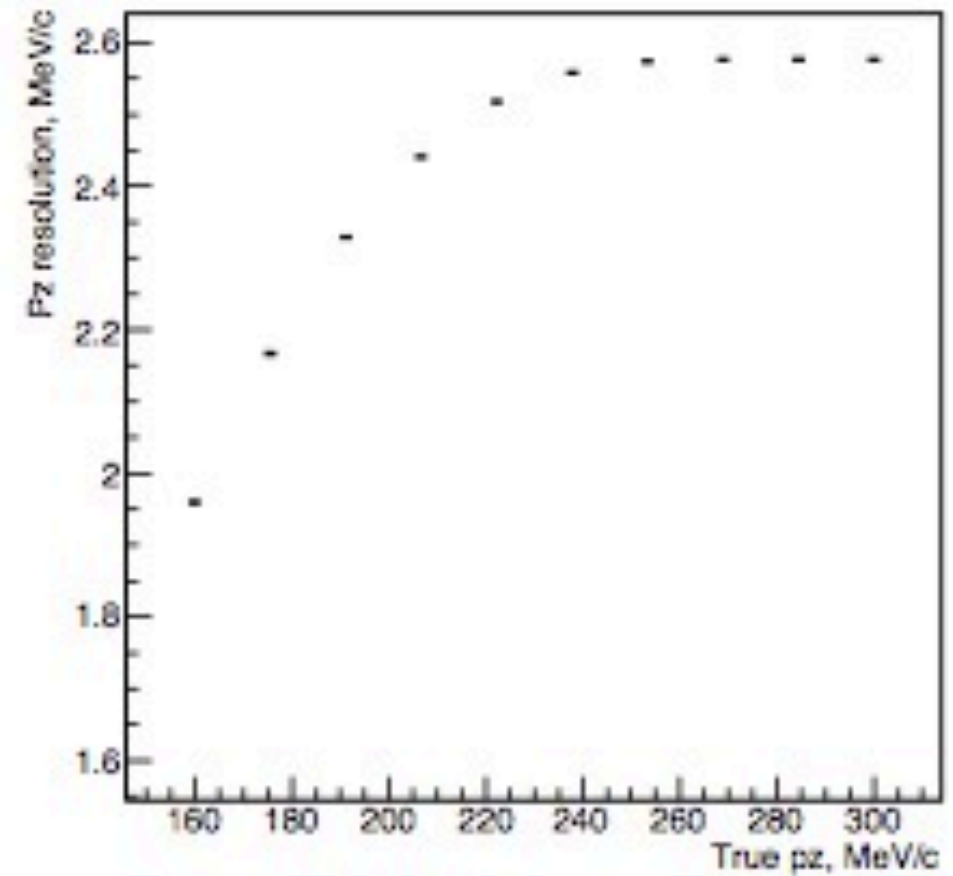
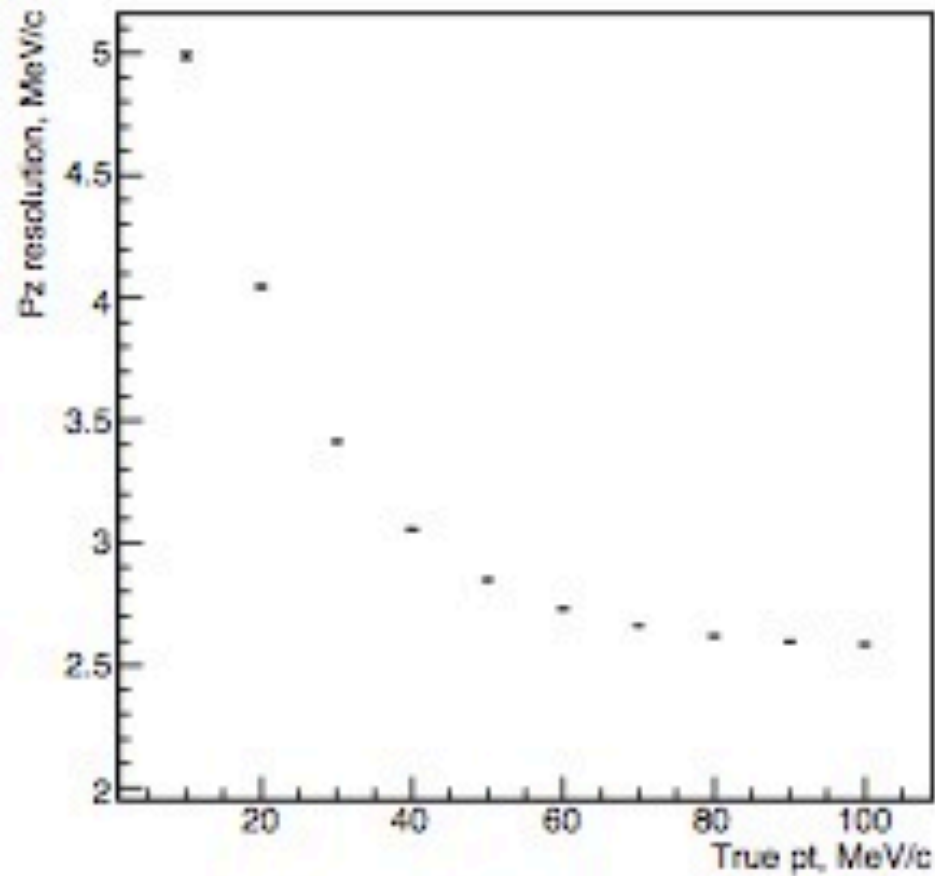
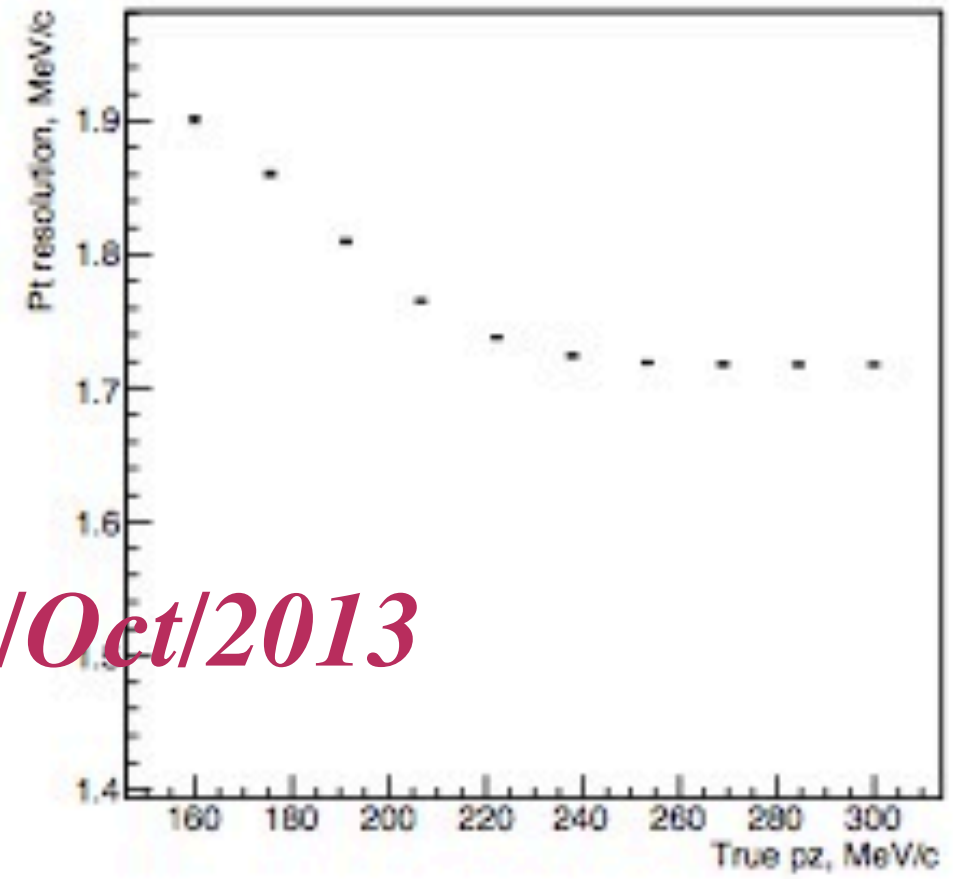
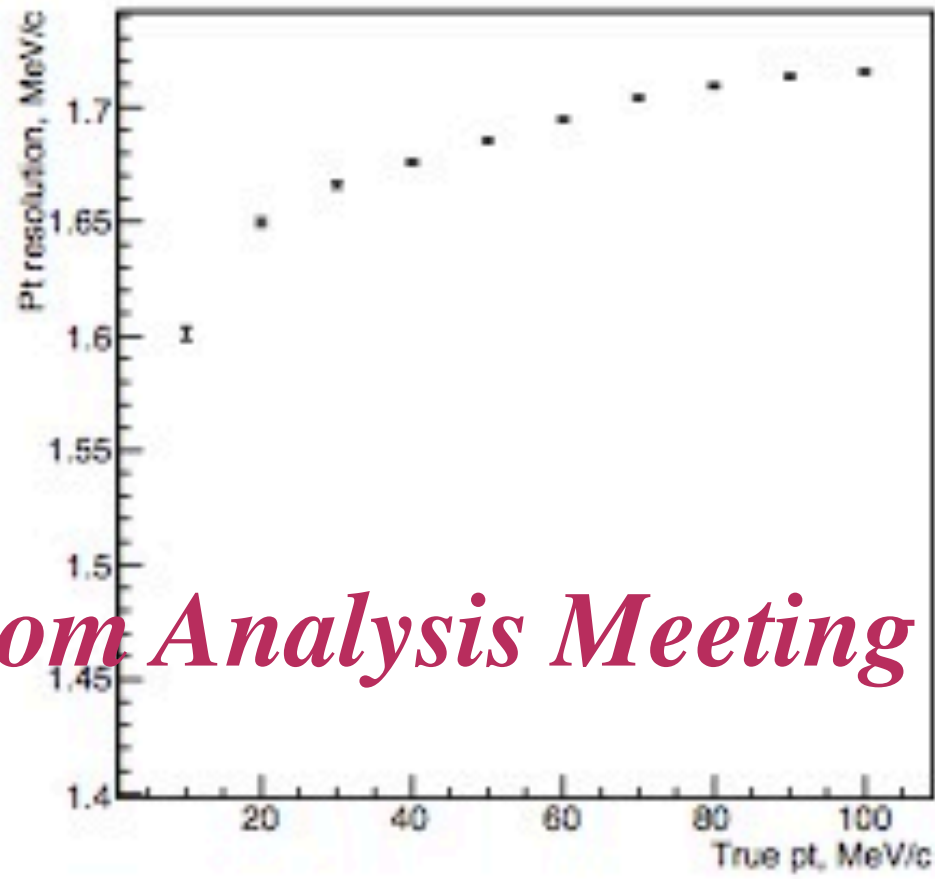
*Ed Santos*

*Analysis Meeting, 23 Jan 2013*

*Liaising with Victoria to complete a Step IV emittance study which includes some intermediate measurements with different sub- configurations.*

*This analysis uses tracker reconstruction only. The resolution has been characterized in the Analysis Meeting of 17/Oct/2013 (see next slide).*

*from Analysis Meeting 17/Oct/2013*





# Crawling towards Step IV

Geometry	Diffuser	Absorber	Sol. Fields	Analysis Goal
a	No	No	No	Measure transmission between trackers and mcs in the detectors.
b	Yes	No	No	Measure mcs in the diffuser.
c	No	Yes	No	Measure mcs in the absorber.
d	No	No	Yes	Measure transmission between trackers.
e	Yes	Yes	Yes	Measure transverse cooling.

Before the complete Step IV setup, there's room for measurements of multiple scattering and particle transmission - all useful for good understanding of the experiment.

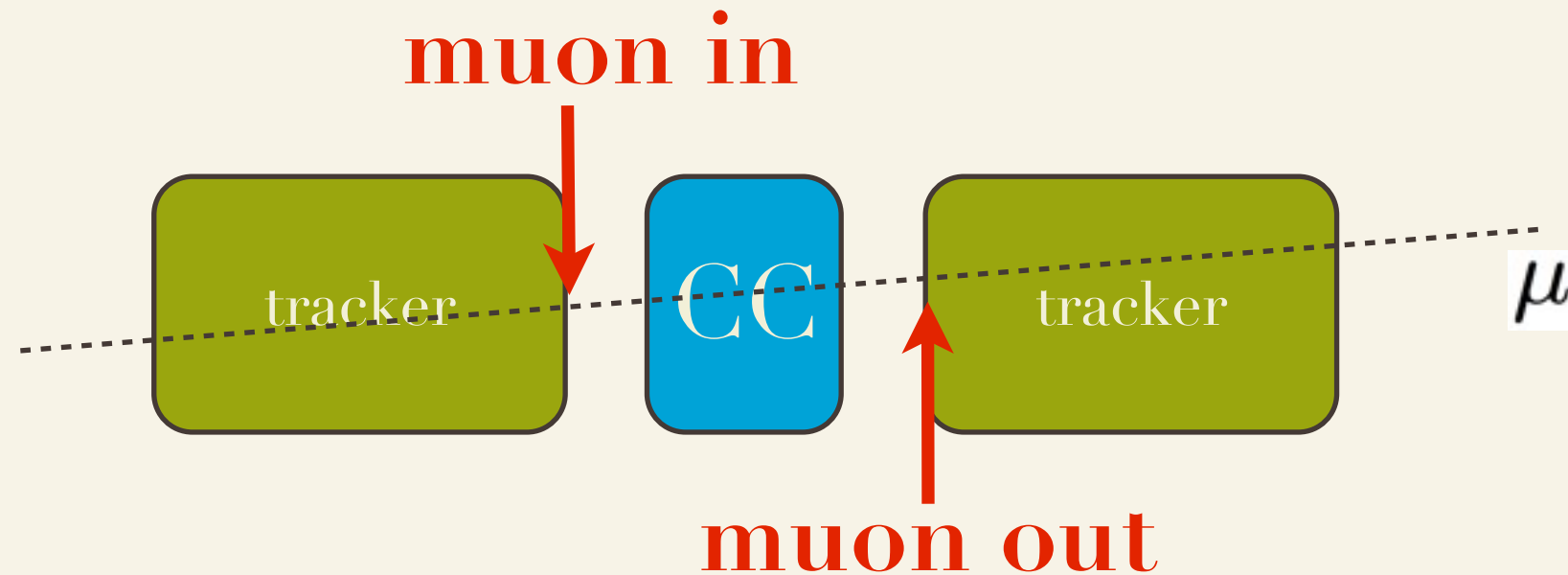
*complete Step IV*

Table 7.1: Geometry stages towards a complete Step IV and intermediate analysis goals.

## 0-Field Measurements

- ~ In a **0-Field Step IV** scenario the trackers can only measure the slopes of the straight tracks crossing them.
- ~ Full momentum recon requires  $P_z$  from the TOF's.

In the next slide, will explore what happens when crossing the *Cooling Channel* (CC)



## Multiple Scattering

as a function of the incident angle

$$\Delta\theta_x = \theta_x^{out} - \theta_x^{in}$$

$$\theta_x^{MCS} = STD(\Delta\theta_x)$$

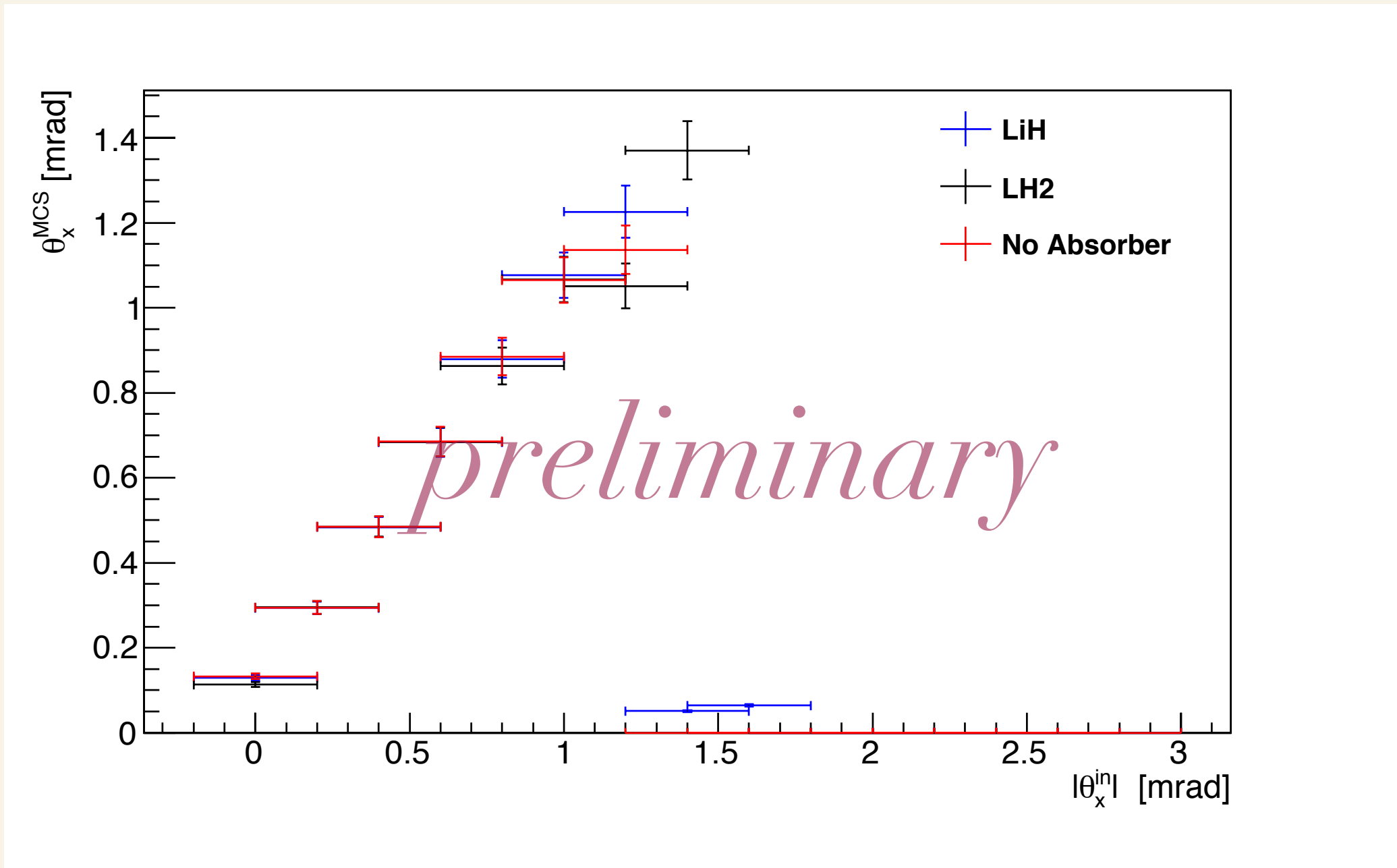
## Transmission

as a function of the azimuthal angle

$$\phi = \text{atan} \left( \frac{P_y}{P_x} \right)$$

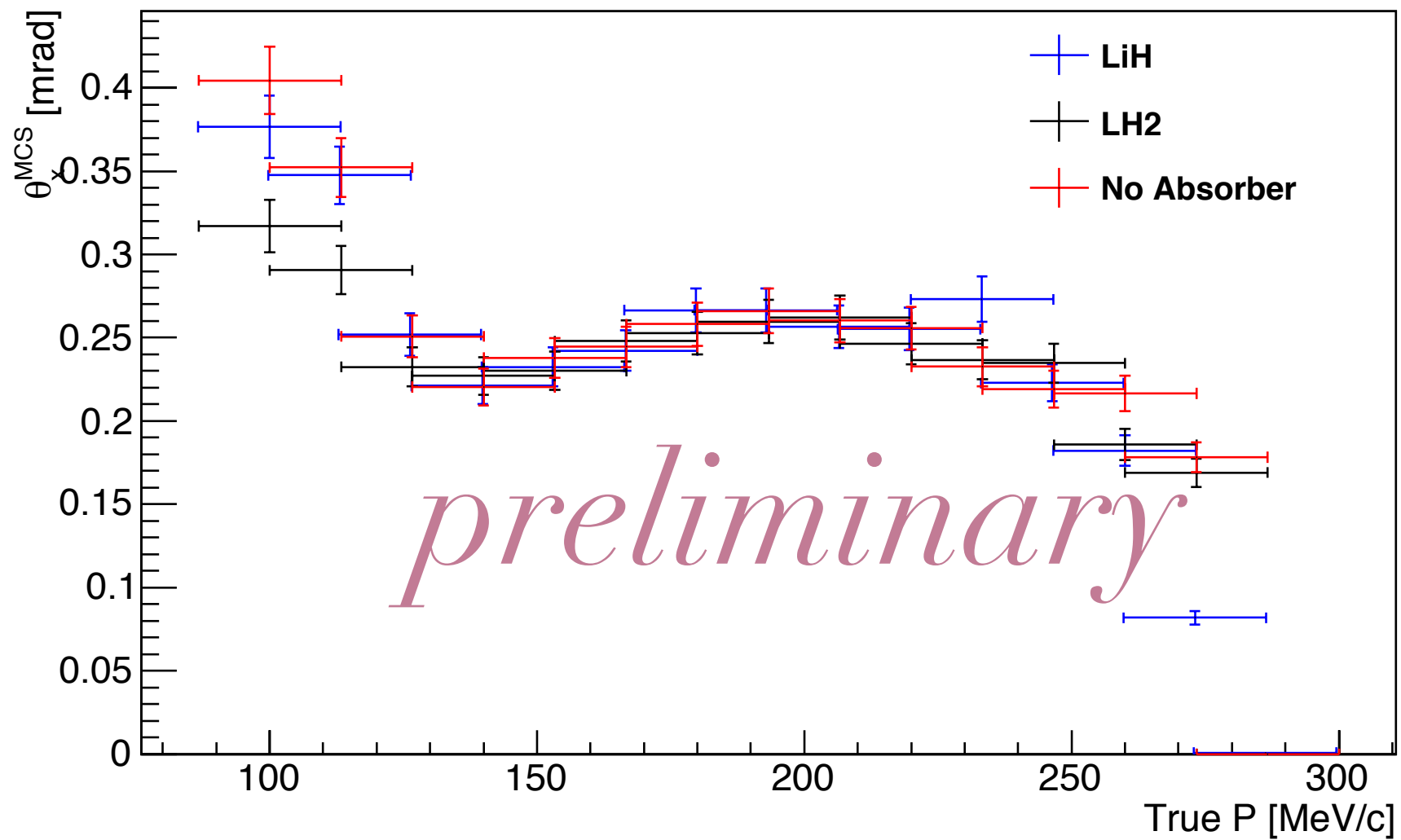
# MCS

For each choice of absorber: 100k muons with  
emittance [0.5, 9.5]



# MCS

For each choice of absorber: 100k muons with  
emittance [0.5, 9.5]





# Next steps

- ~ Evaluate transmission in the same scheme
- ~ Turn field on and look at change in emittance