

# Status of the secondary target for the hypernuclear experiment

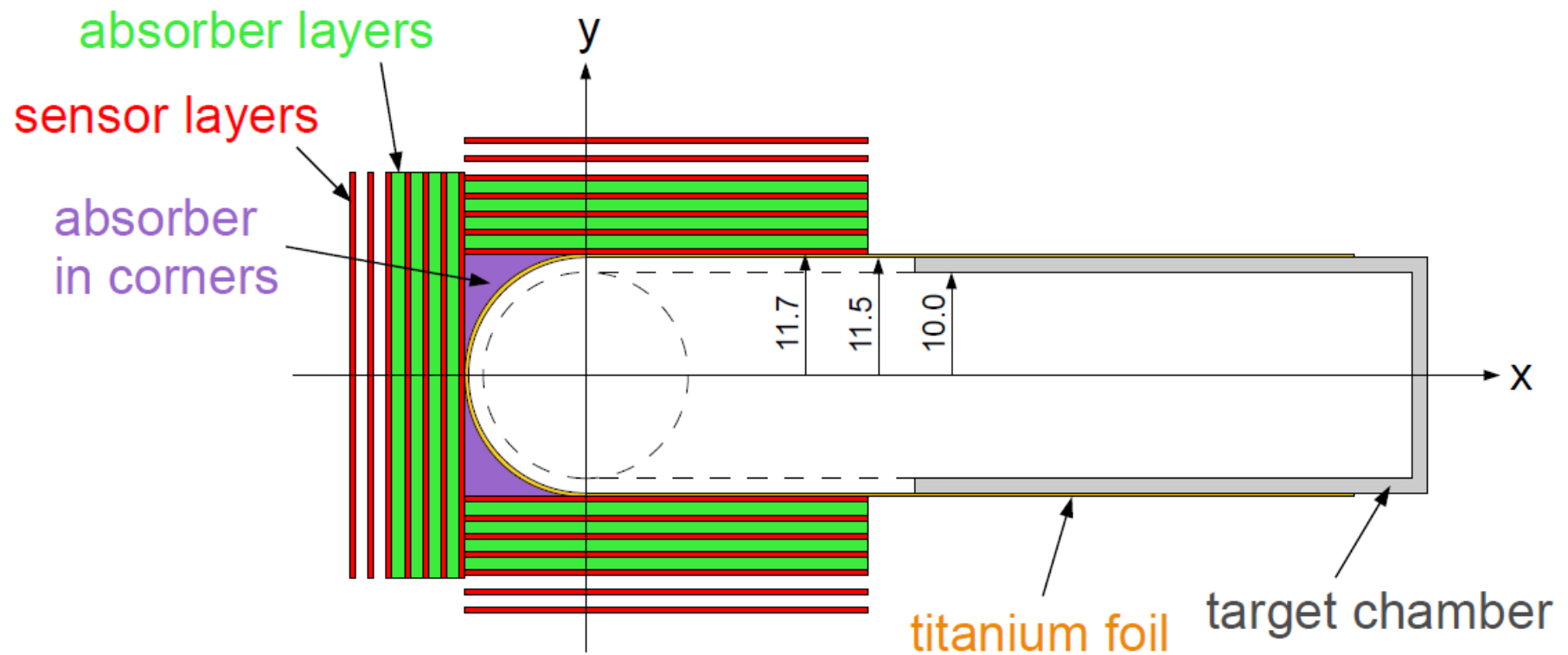
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PANDA-Meeting December 10<sup>th</sup>, 2014

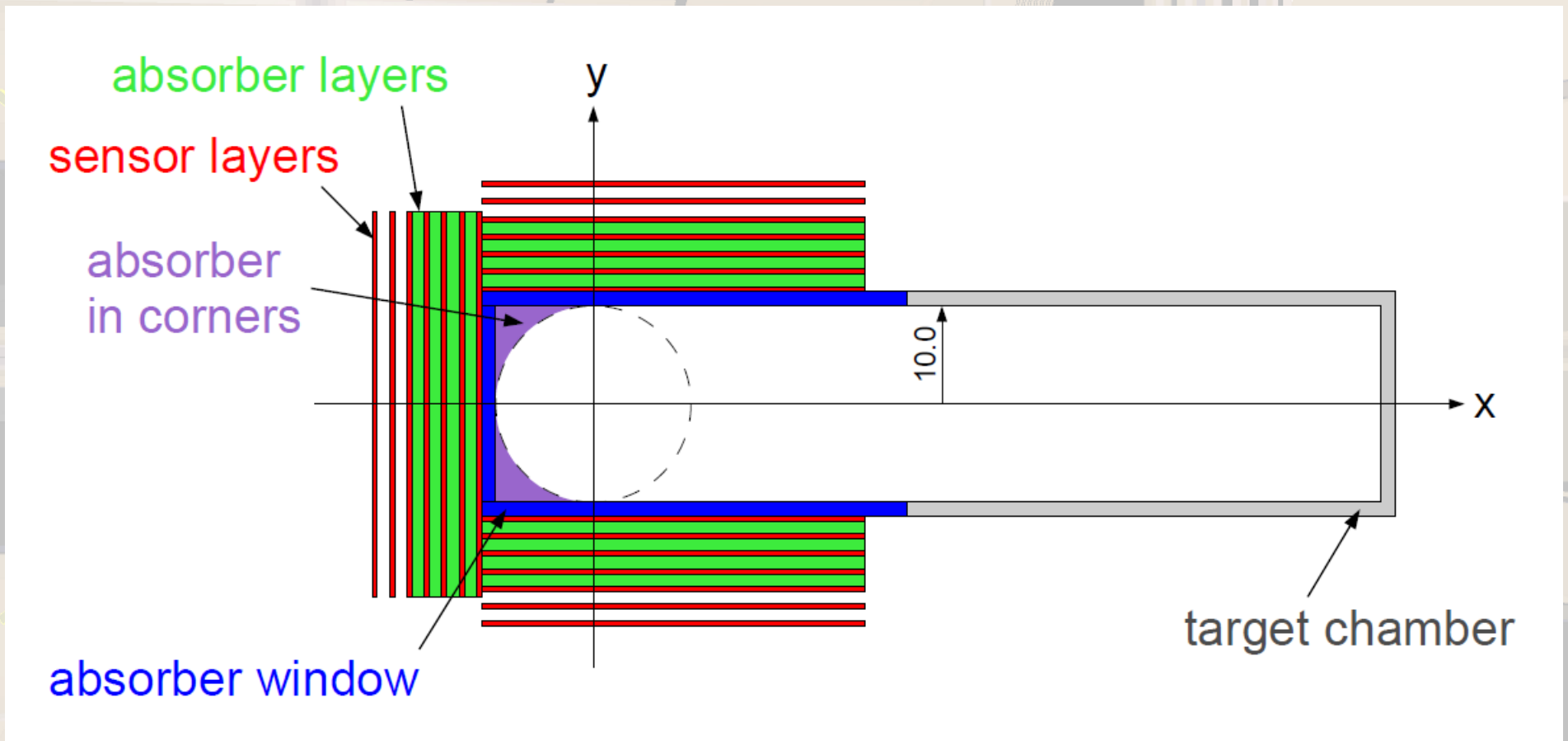
# Arrangement of the layers

## Target chamber with thin foil



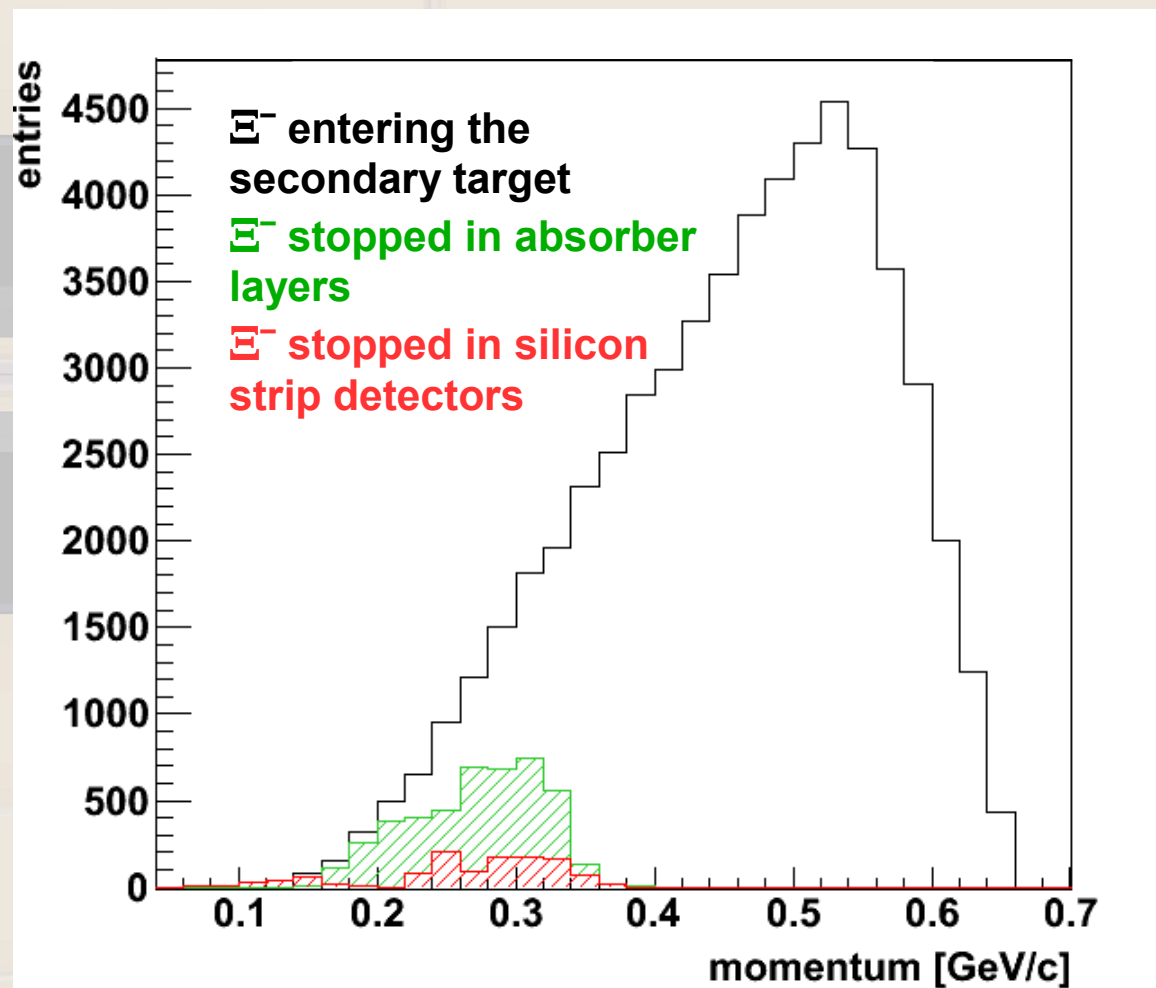
# Arrangement of the layers

## Target chamber with absorber window



# Simulations of the geometries

Simulation of  $\Xi^-$  with a created generator of parametrized GiBUU events

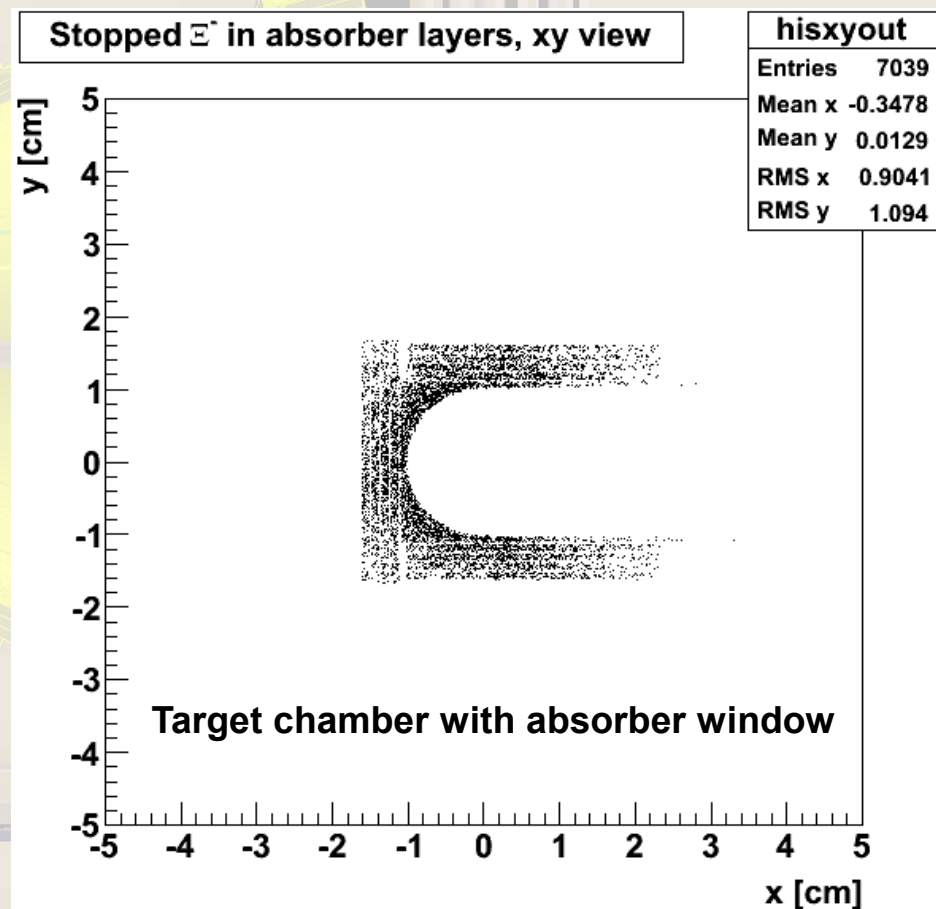
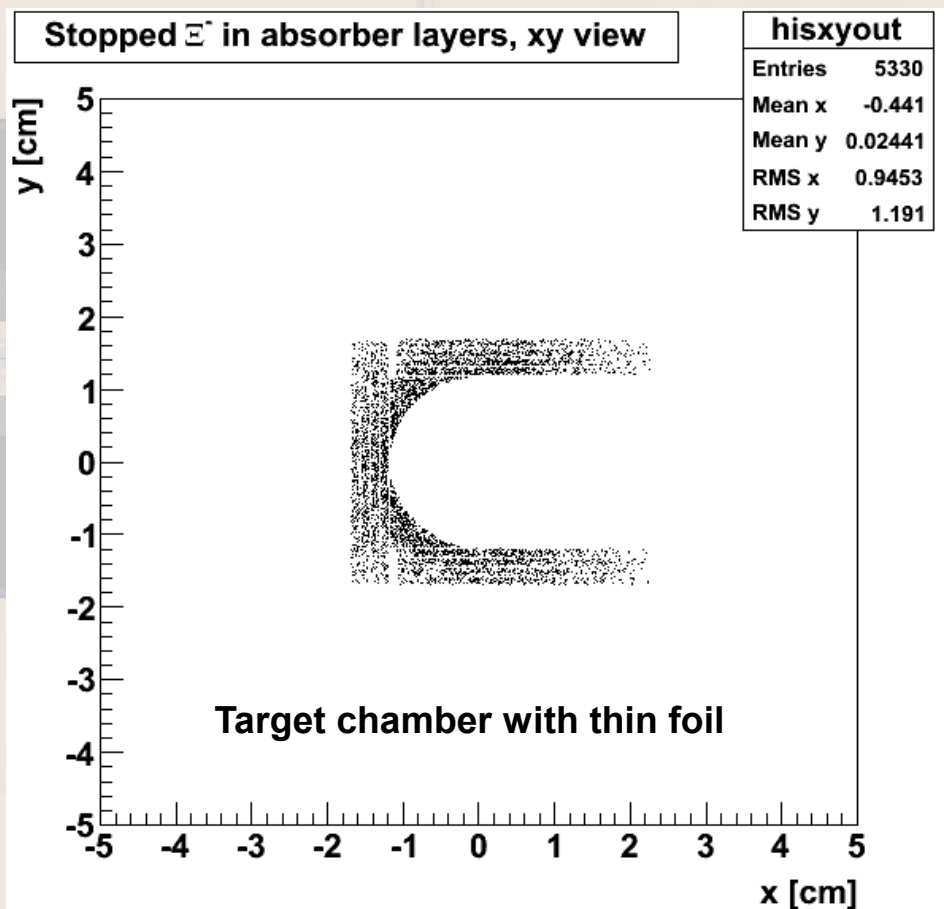


momentum distribution of stopped  $\Xi^-$  at the entrance of the secondary target

→ only  $\Xi^-$  in the momentum range from about 0.1 to 0.5 GeV/c that means  $\theta$  from  $100^\circ$  to  $180^\circ$  can be stopped

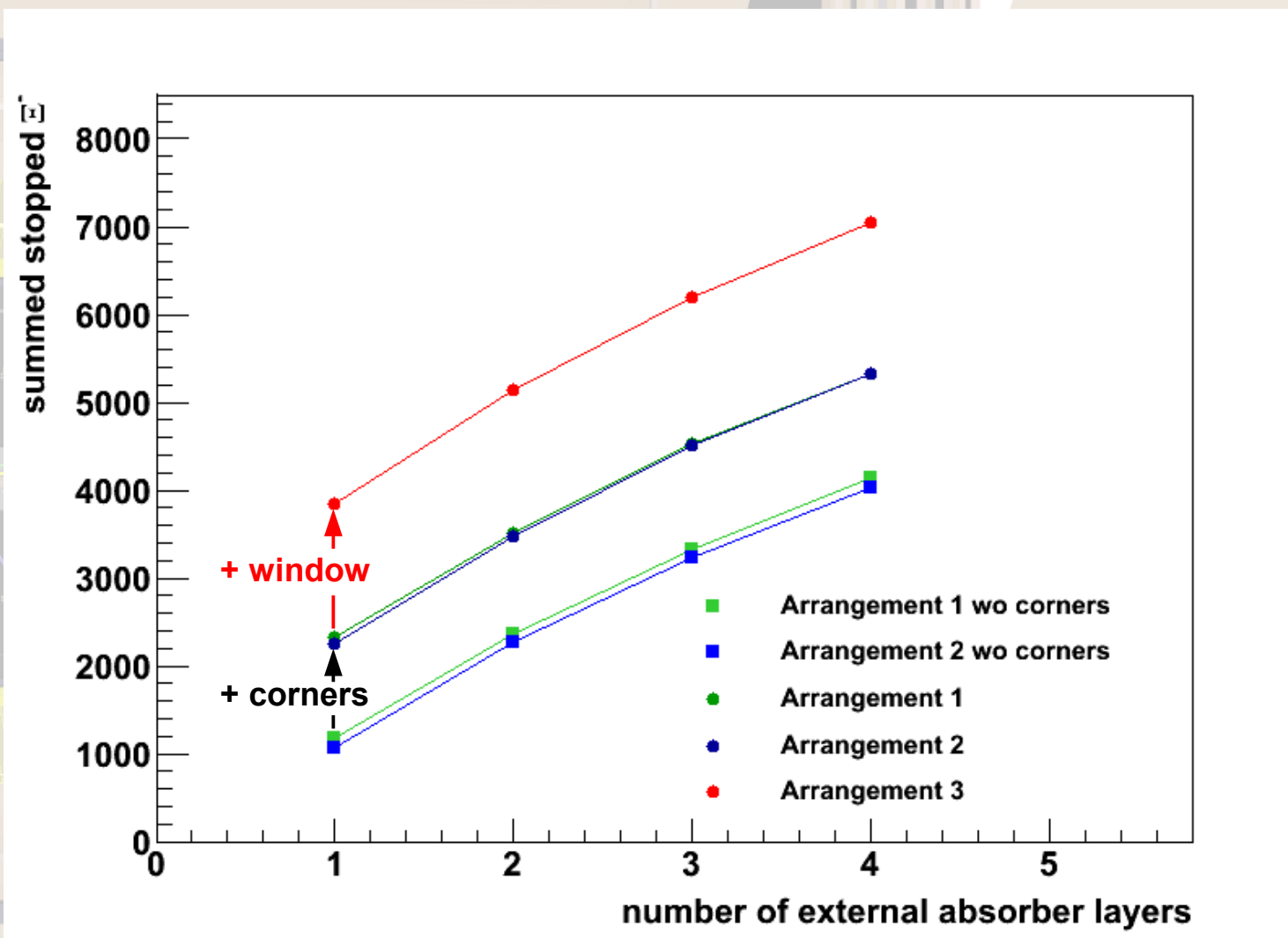
# Simulations of the geometries

Simulation of  $\Xi^-$  with a created generator of parametrized GiBUU events in a theta range from  $70^\circ$  to  $180^\circ$



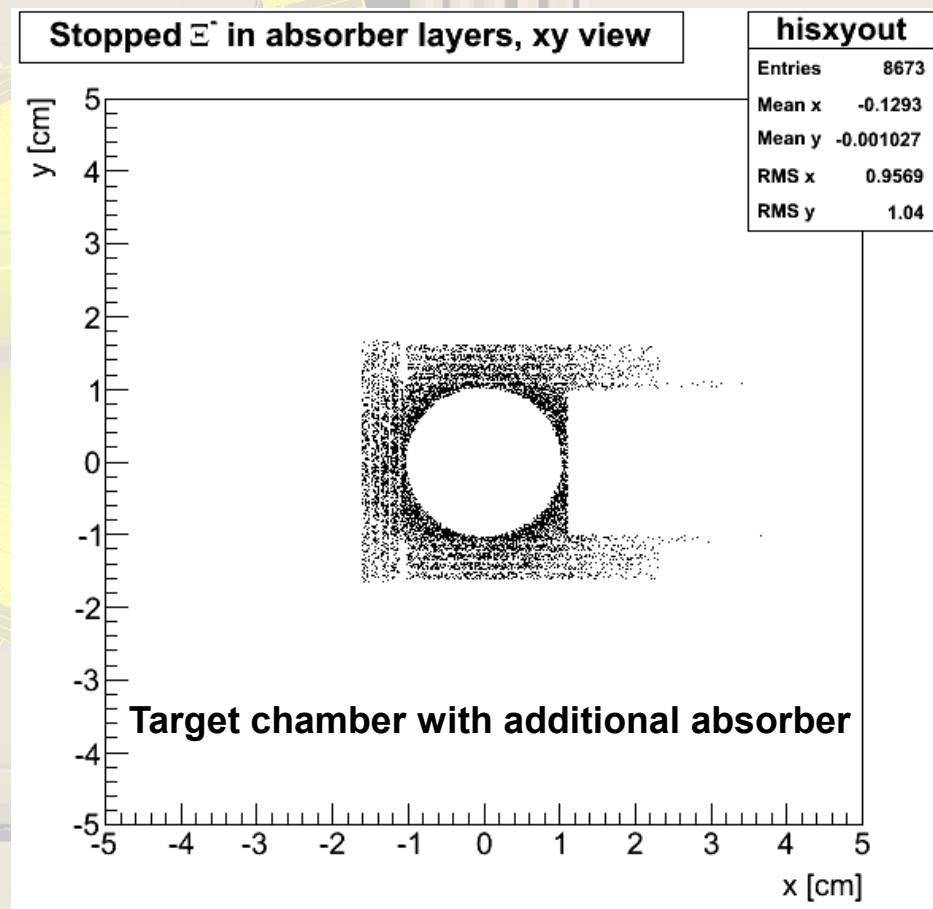
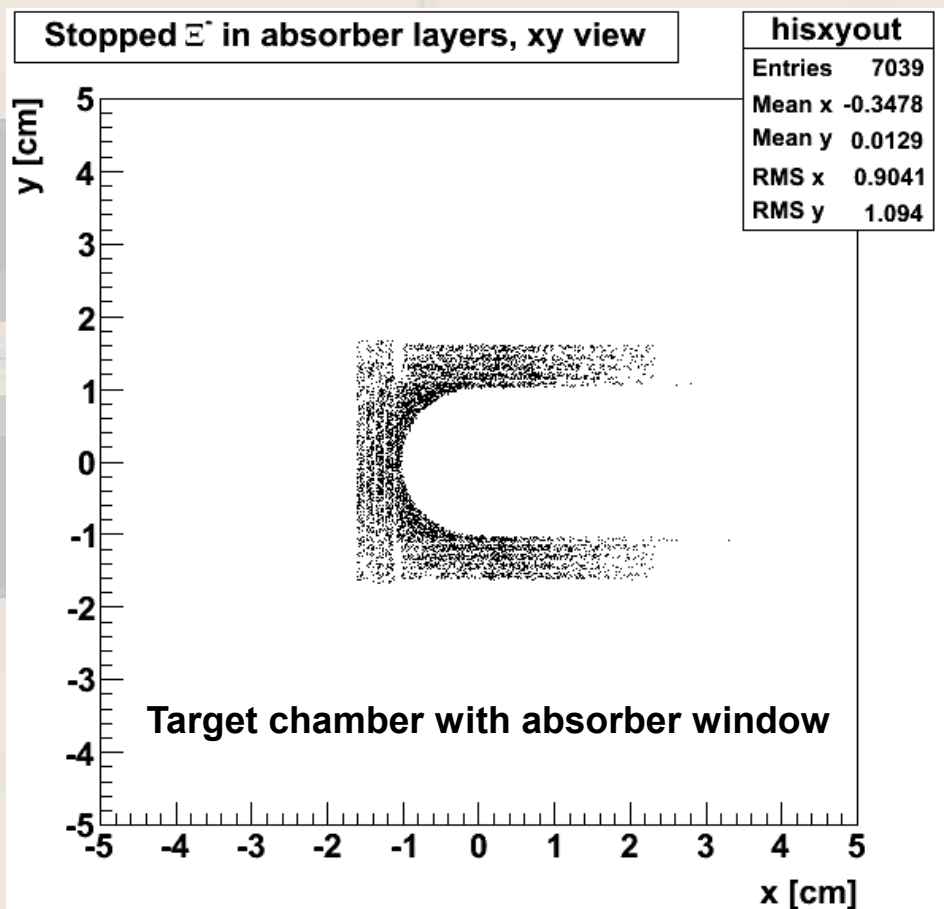
# Arrangement of the layers

Summary plot  
for stopped  $\Xi^-$



# Simulations of the geometries

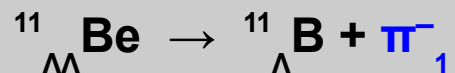
Simulation of  $\Xi^-$  with a created generator of parametrized GiBUU events in a theta range from  $70^\circ$  to  $180^\circ$



# Pion tracking

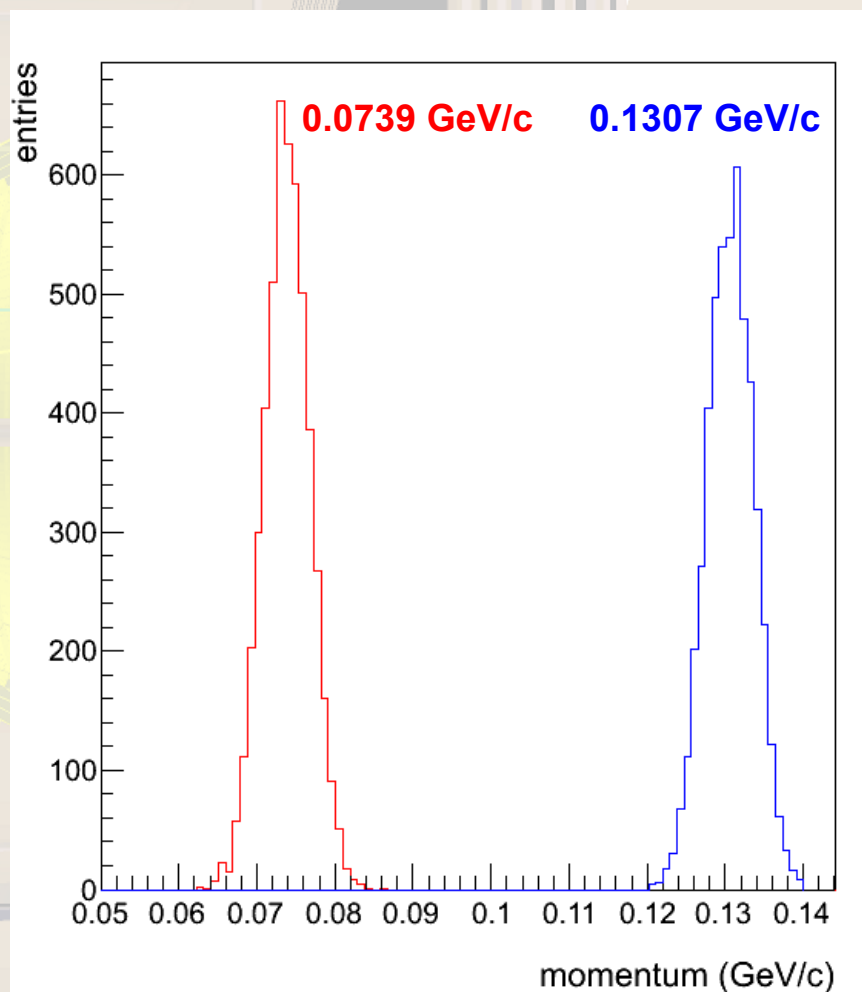
## Concept of the pion tracking:

- extract the coordinates of the  $\Xi^-$  stopping points
- placing  ${}^{11}_{\Lambda}\text{Be}$  double hypernuclei
- phase space decay by Geant4



- smearing of the pion points with spatial resolution
- track finding and track fitting for  $\pi^-_1$  and  $\pi^-_2$
- momentum reconstruction

## expected momentum distribution:





# Pion tracking

Reconstructed momenta for all pions:

best result

$p_1 = 128.98 \text{ MeV}/c$

$p_2 = 71.29 \text{ MeV}/c$

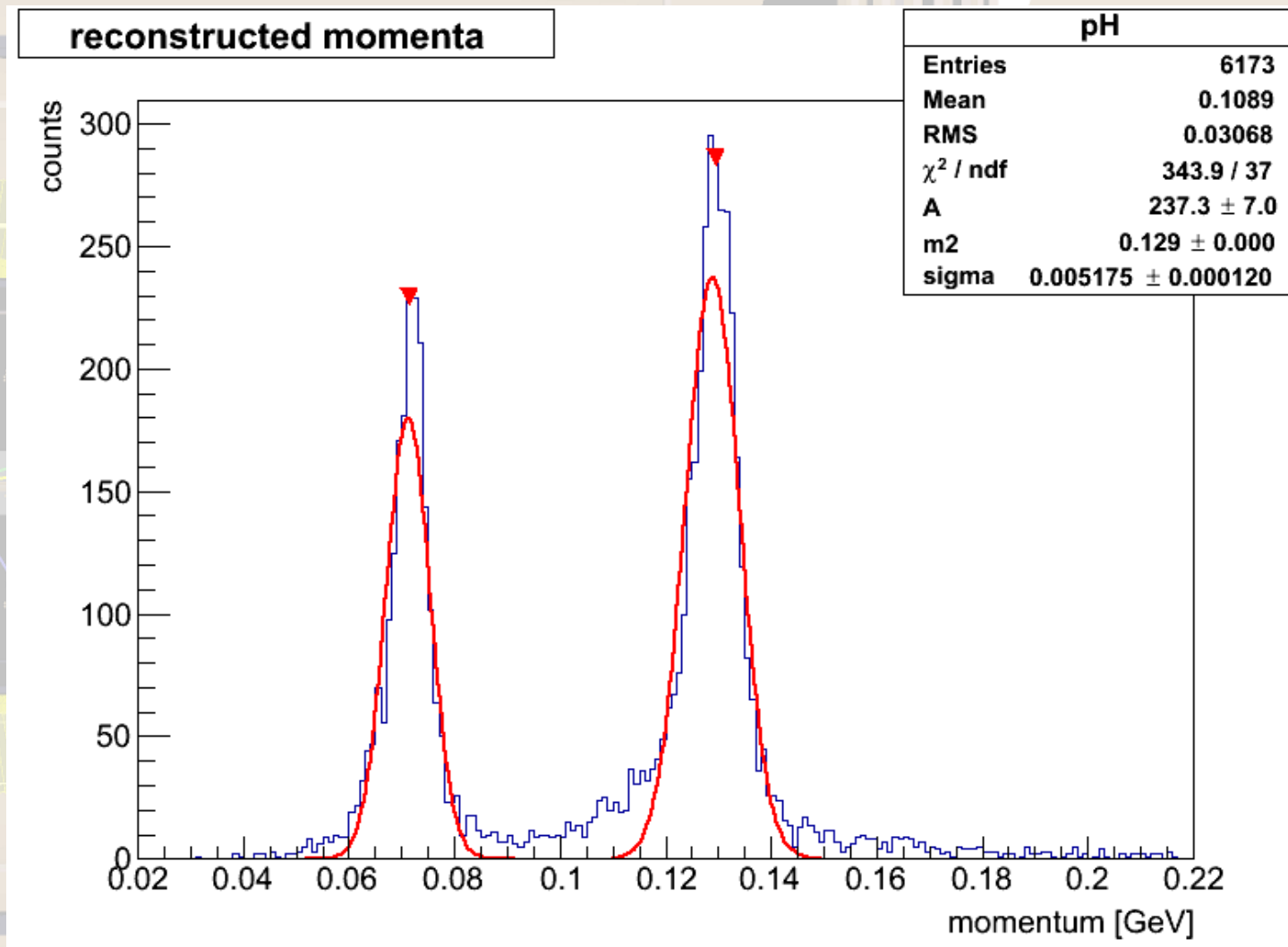
$res_1 = 9.4 \%$

$res_2 = 13.8 \%$

efficiency = 57.9 %

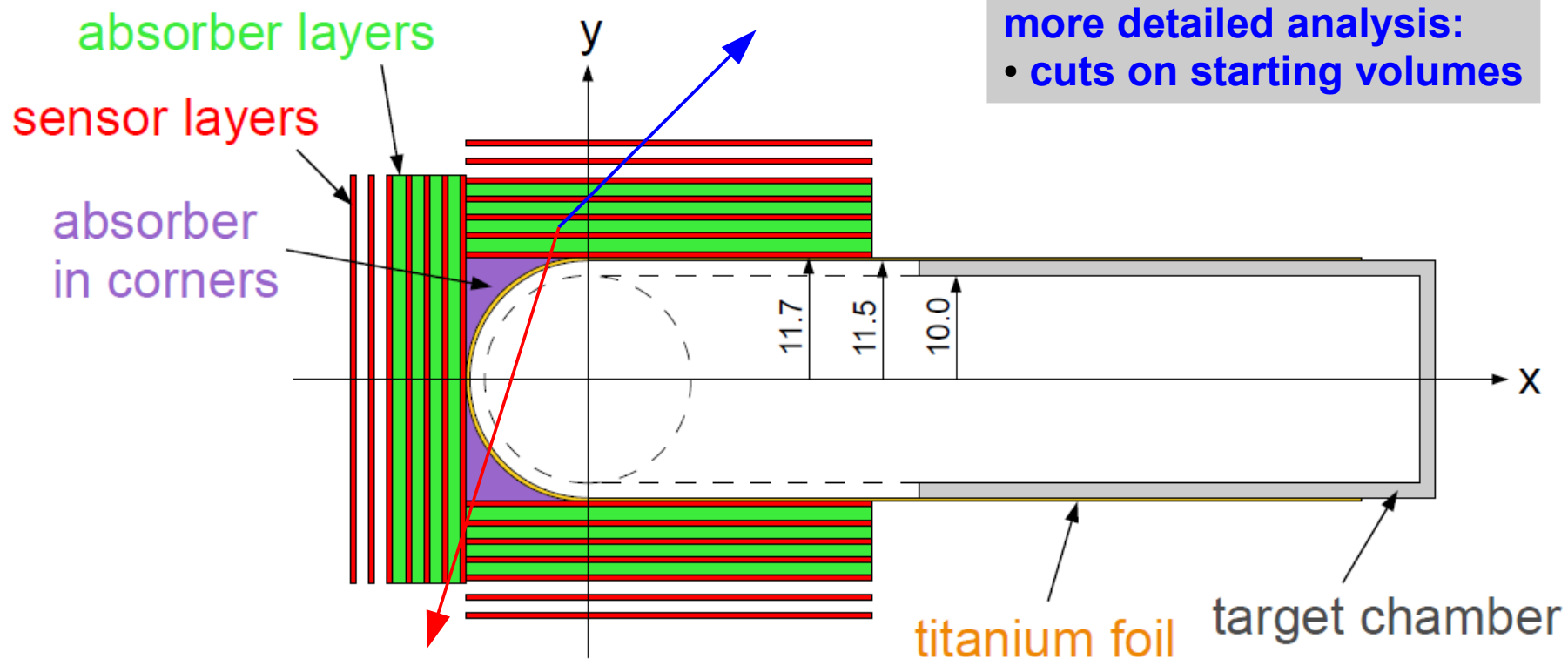
for arrangement 1

but results for the other arrangements very close



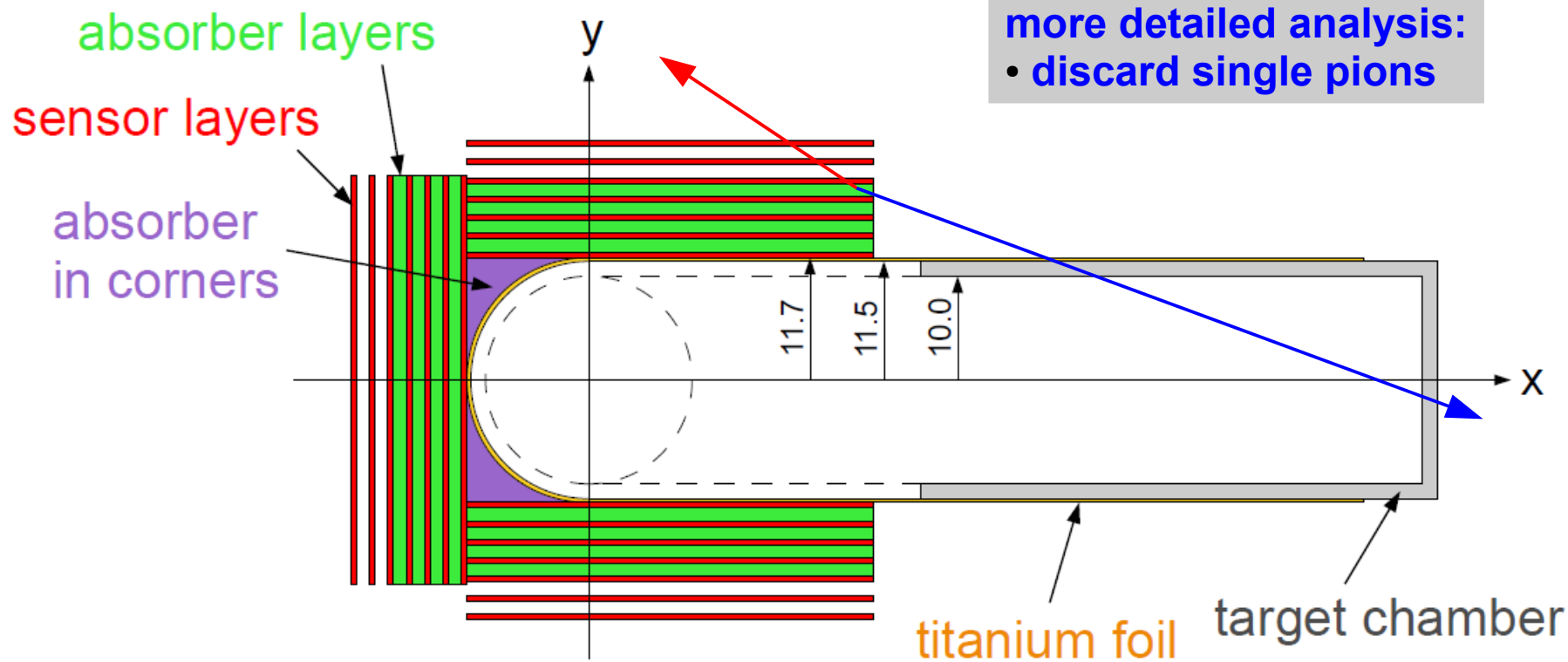
# Pion tracking

## Target chamber with thin foil



# Pion tracking

## Target chamber with thin foil



# Outlook

- ongoing GiBUU simulations to get more statistics
- more detailed analysis of the pion tracking
- further studies of the arrangement and thickness of the layers in case of the stopping  $\Xi^-$  and the pion tracking