

# Phoswich study using Trento beam line



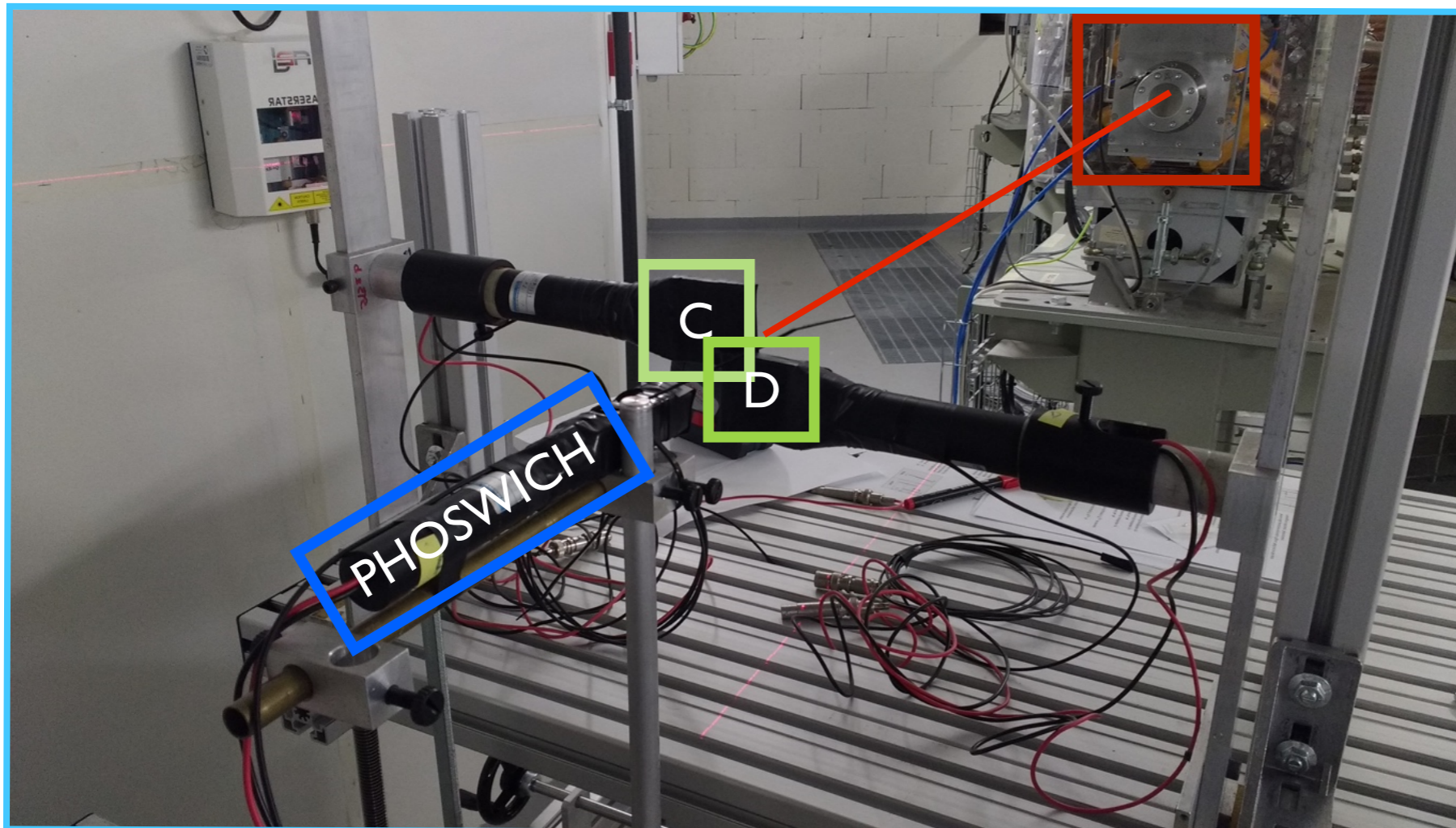
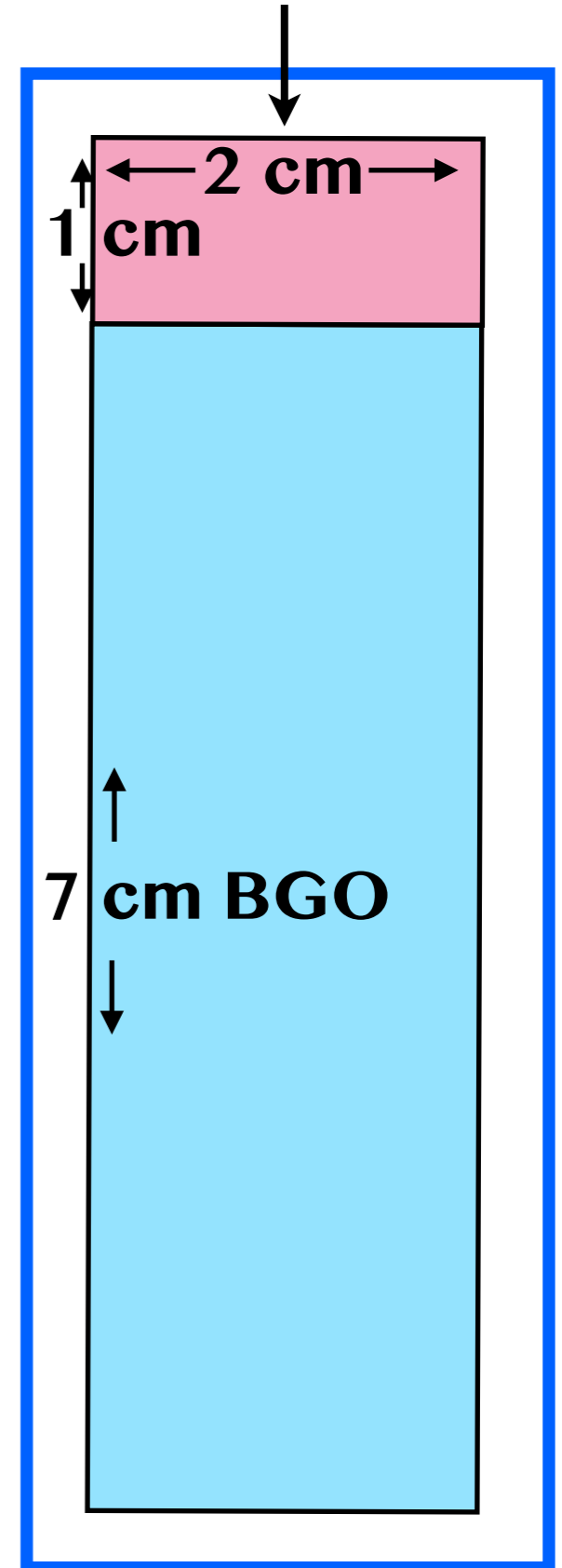
## FragmentatiOn Of Target

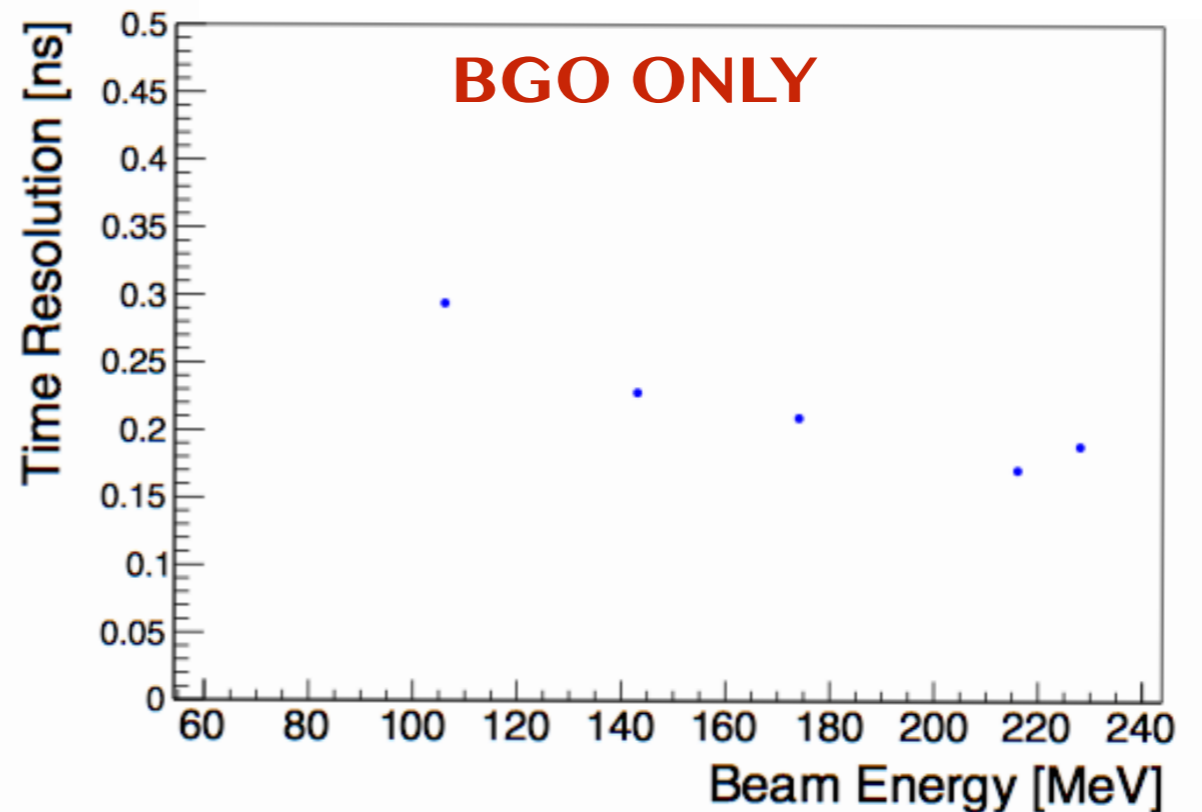
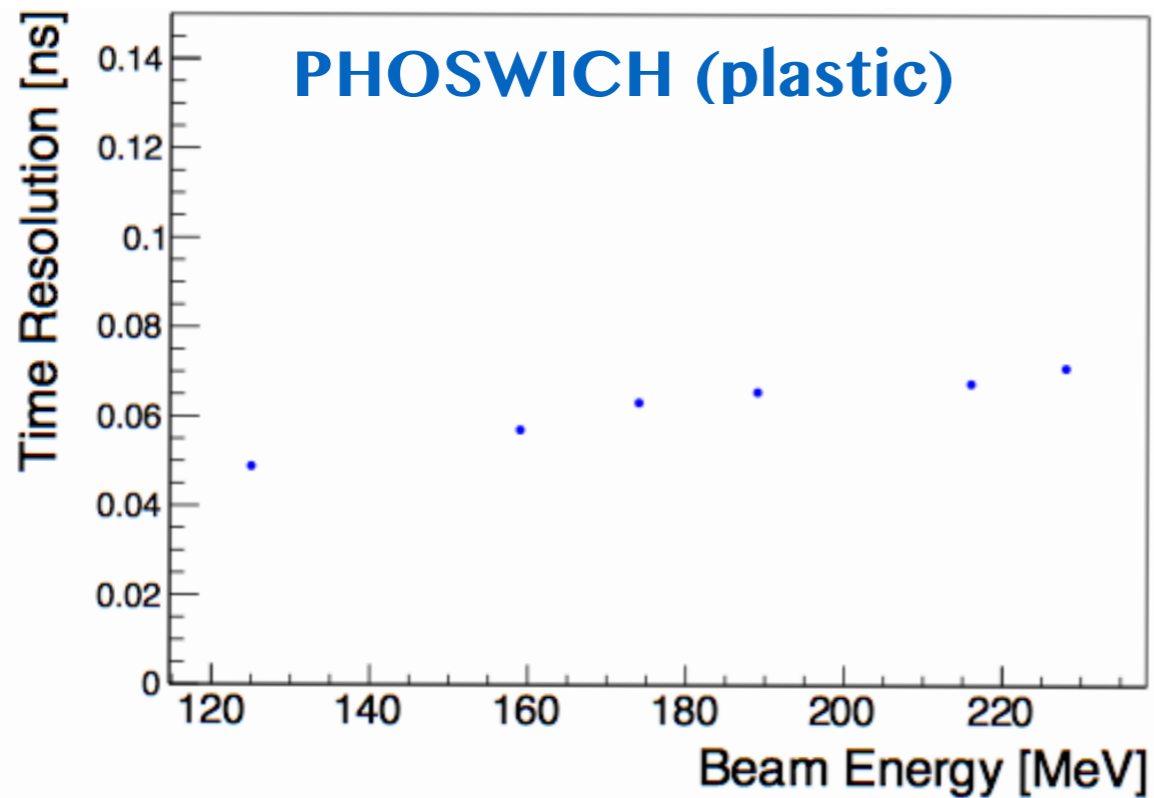
07/11/2017

## Phoswich detector characterisation:

- Energy calibration
- Time resolution

plastic/pterphenyl/lyso





## PHOSWICH Time Resolution:

- plastic scintillator  $\cong 70$  ps
- lyso  $\cong 120$  ps
- pterphenyl  $\cong 55$  ps

## BGO Time Resolution:

- about 230 ps

(\*) the analysis was carried out using oscilloscope's measurements and a low statistics

- Better statistics, 10000 waveforms
- $\Delta t$  taken at half-height
- **Single time resolutions**

From the time resolution plot  
between STS C and STS D:



$$\sigma_1^2 = \sigma_{stsD}^2 + \sigma_{stsC}^2$$

From the time resolution plot  
between STS C and BGO:



$$\sigma_2^2 = \sigma_{bgo}^2 + \sigma_{stsC}^2$$

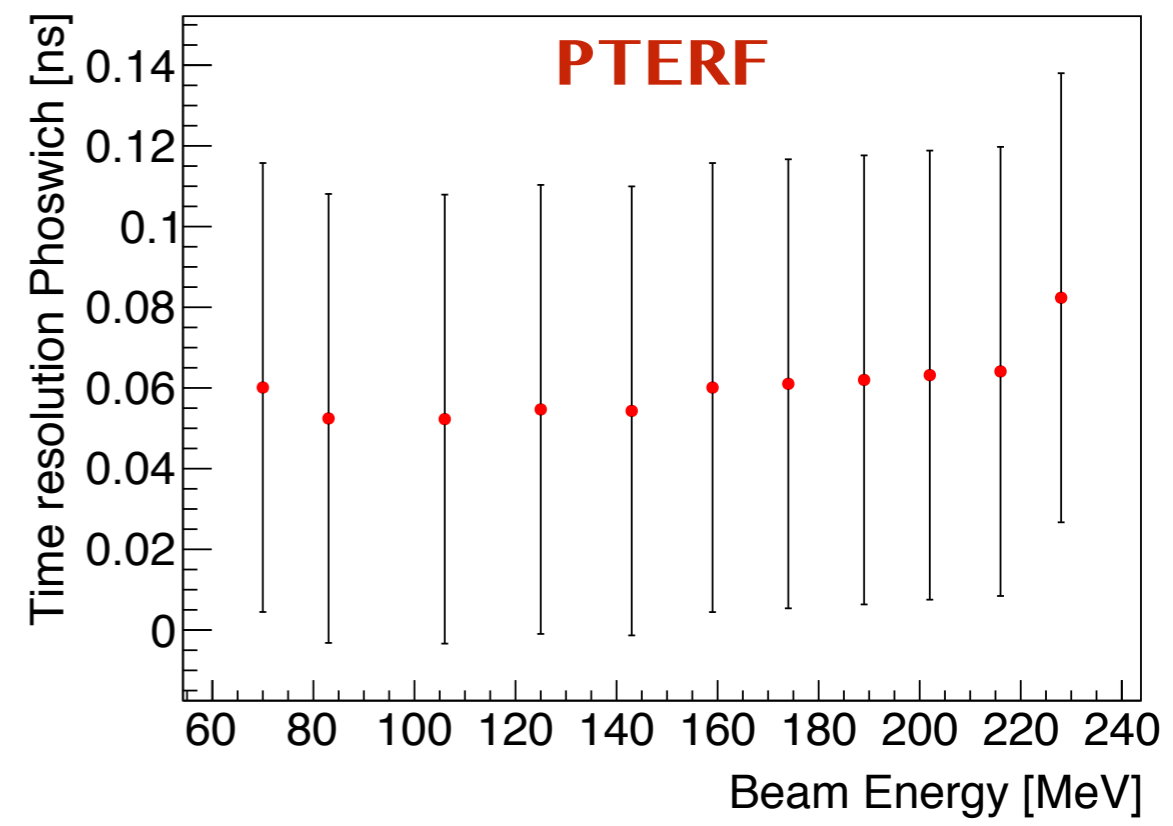
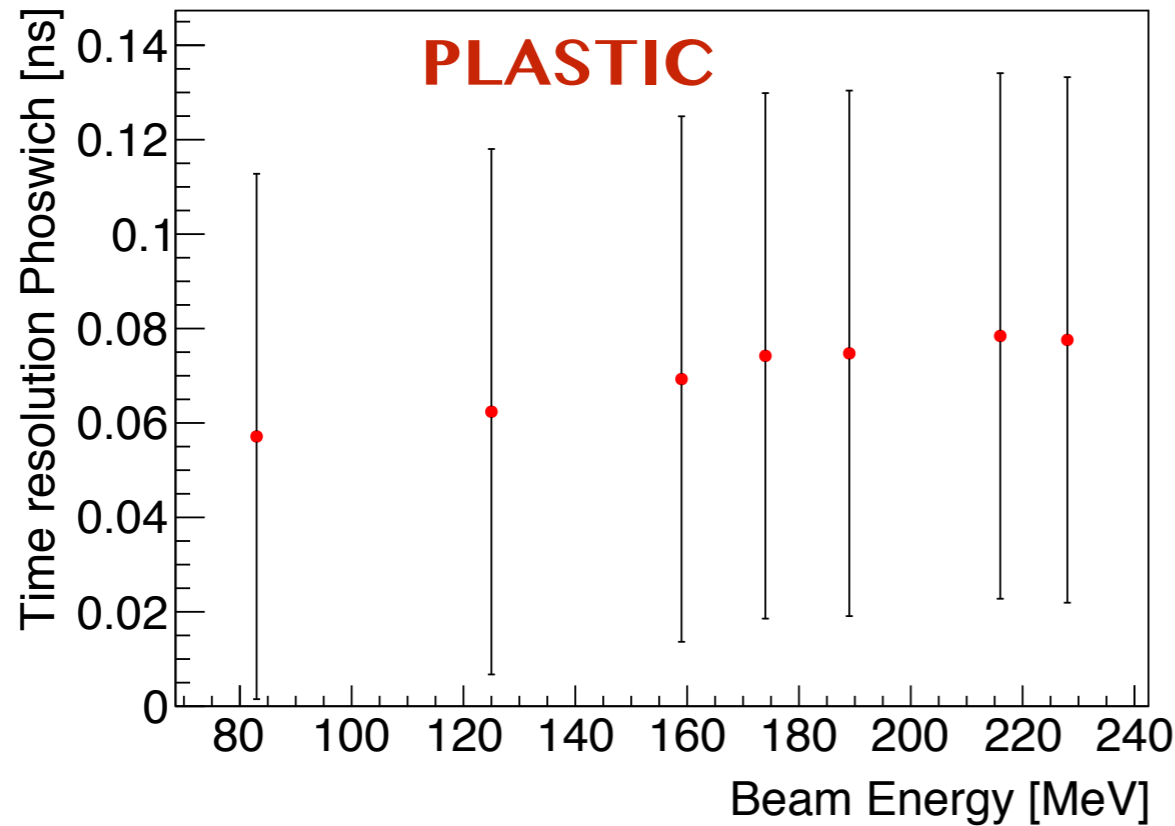
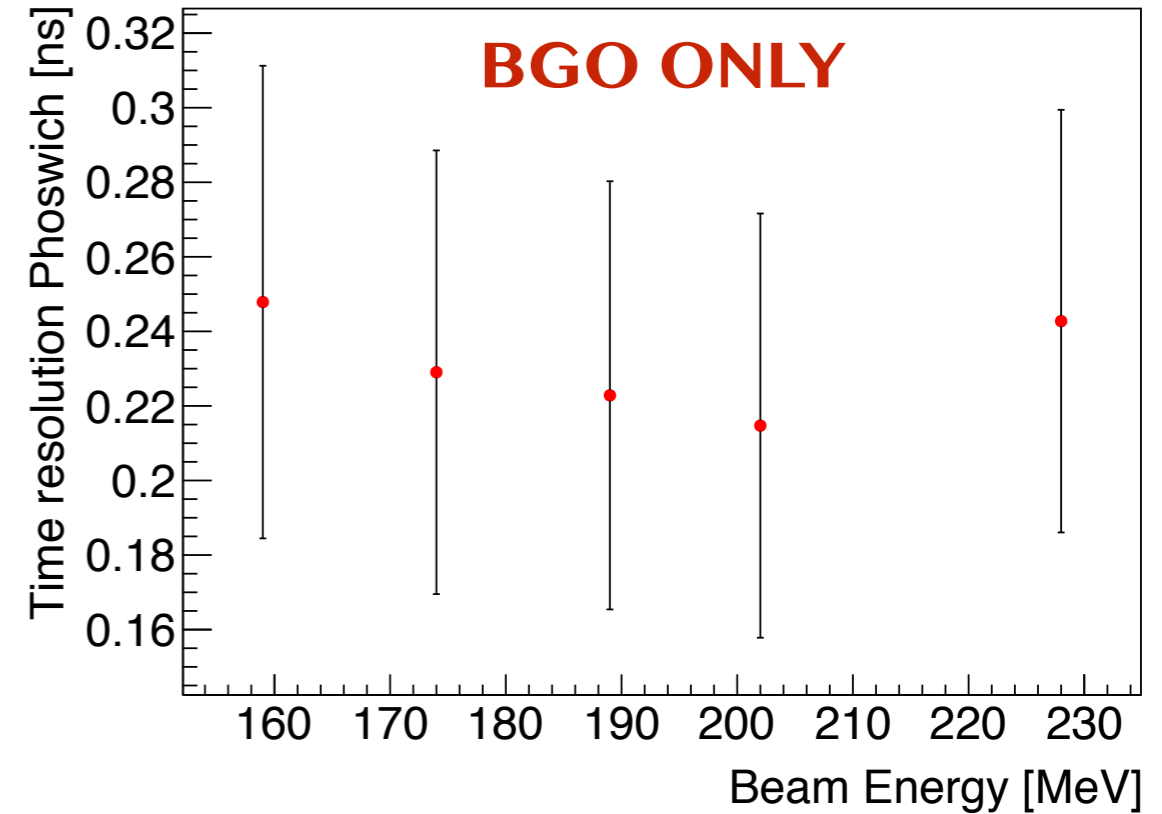
From the time resolution plot  
between STS D and BGO:



$$\sigma_3^2 = \sigma_{stsD}^2 + \sigma_{bgo}^2$$

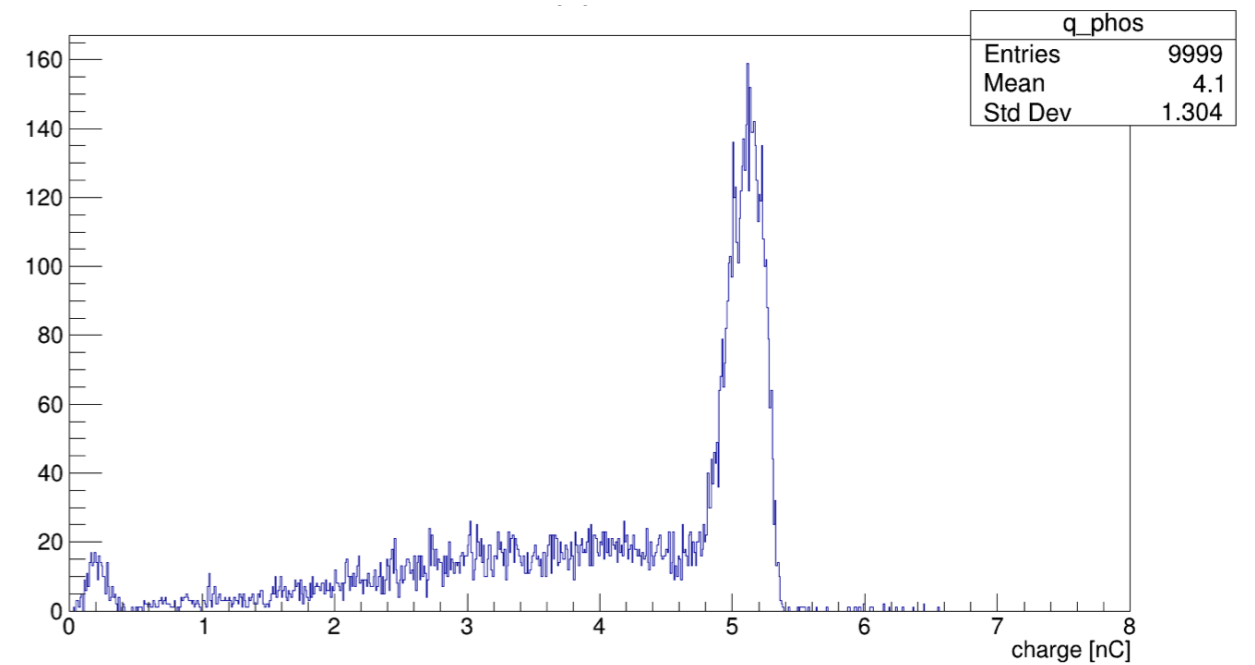
- Better statistics, 10000 waveforms
- $\Delta t$  taken at half-height
- **Single time resolutions**

**Pardon the errors!**

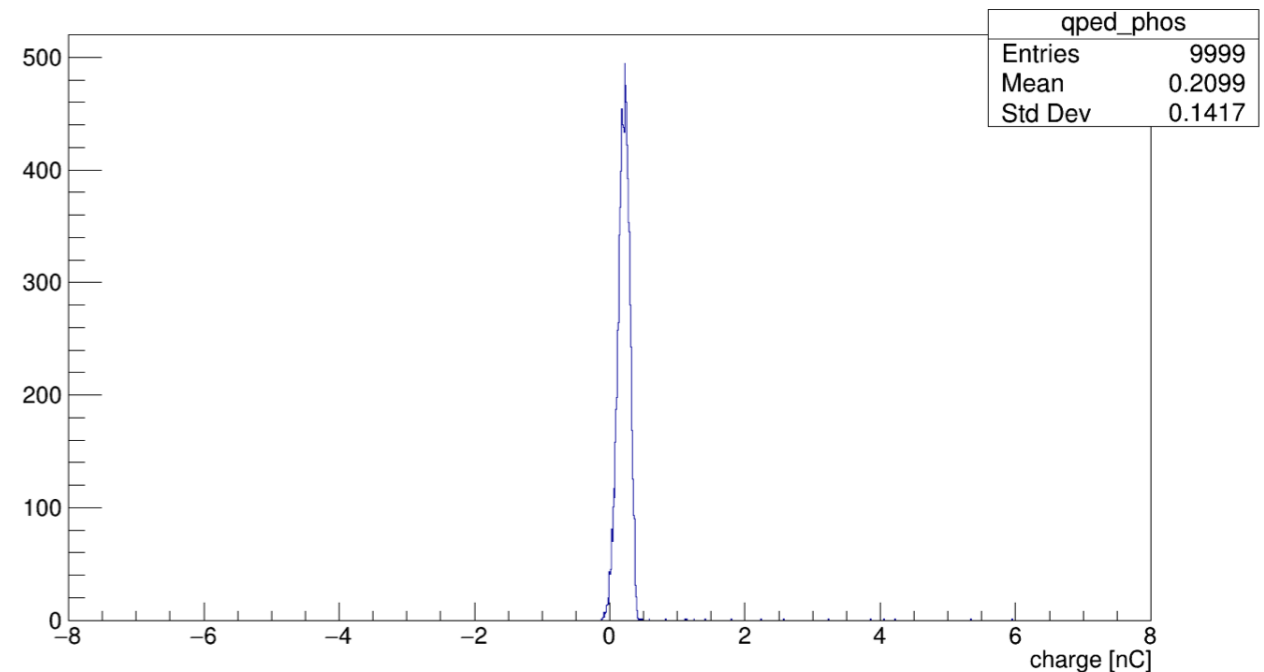


- Better statistics, 10000 waveforms
- $\Delta t$  taken at half-height
- Single time resolutions
- **Charge - pedestal**

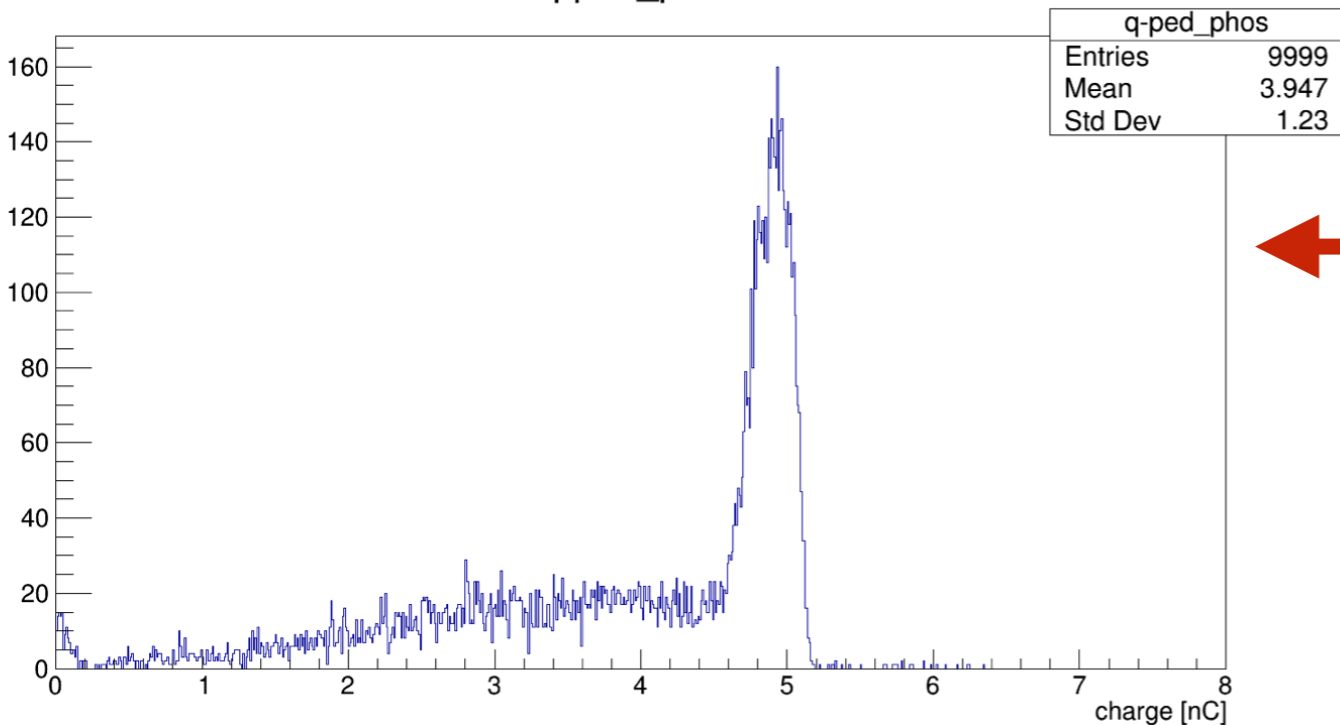
Charge



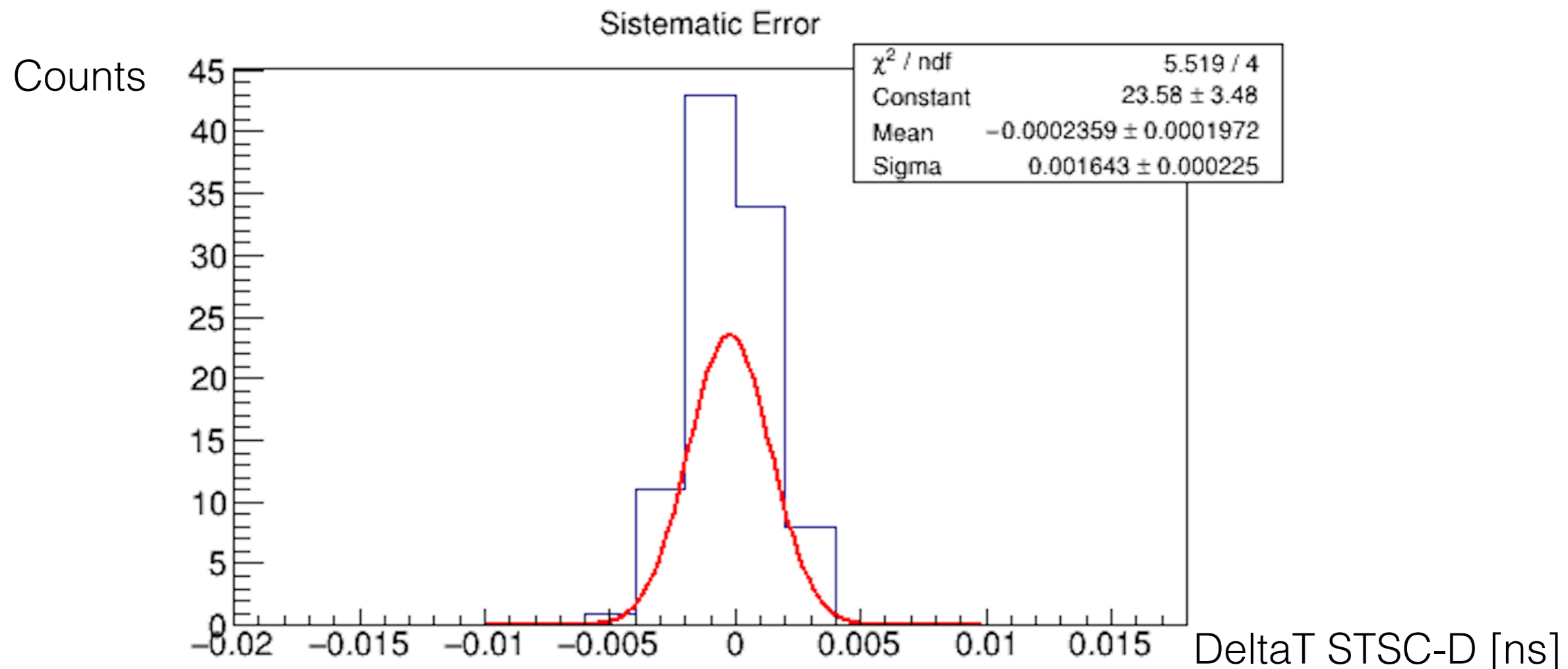
Pedestal



q-ped\_phos



- Better statistics, 10000 waveforms
- $\Delta t$  taken at half-height
- Single time resolutions
- Charge - pedestal
- **Systematic error** using STS C and D



## Paper Structure:

- Introduction and beam's characteristics (prof ASS A. Sarti)
- Experimental setup and DAQ (Debora)
- prof Pat Simulation (Debora)
- Results (Debora & Giacomo: short explication of oscilloscope's waveforms and analysis)
- Conclusions



- Charge analysis
- Errors, of course



- Writing, correcting, rewriting, correcting again, writing the last time, submitting, crossing fingers