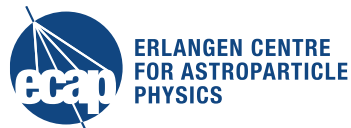


Update on wide SciRods

ERLANGEN CENTRE
FOR ASTROPARTICLE
PHYSICS

Merlin Böhm
Gießen, 17.03.2015



Outline

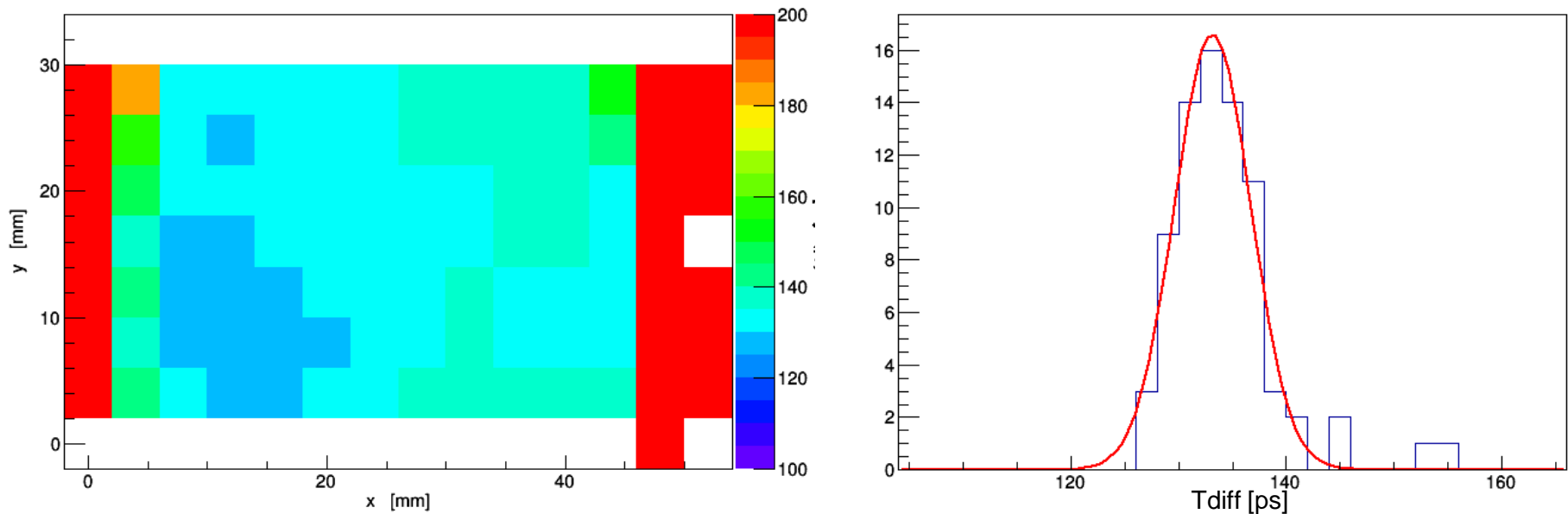
- Scintillator treatment
- Comparison between BC408, BC418 and BC420
- Comparison in SciRod thickness

Scintillator treatment

- Cutting with band saw
 - Milling the edges
 - Polishing the edges with 2400 grain silicon carbide paper
 - Polishing the edges with acrylic glass repair paste
-
- ->Still problems with BC420

Comparison between BC408, BC418 and BC420

TDiff Resolution



$$\sigma_t = \frac{T_2 - T_1}{2}$$

Comparison between BC408, BC418 and BC420

- Scintillator: 5x3x0.5 cm, -20mV threshold
- Sensor: Hamamatsu S12572-050P, 4 per side in series

| | Unwrapped 4V | Unwrapped 6V | Paper 4V | Paper 6V |
|-------|-----------------|-----------------|-------------|-------------|
| BC420 | 93 ± 4 | 72 ± 3 | 84 ± 3 | 68 ± 2 |
| BC418 | 92 ± 3 | 74 ± 2 | 79 ± 2 | 67 ± 2 |
| BC408 | 135 ± 4 | 95 ± 2 | - | - |

Comparison between BC408, BC418 and BC420

- Scintillator: 5x3x0.5 cm, -20mV threshold
- Sensor: Hamamatsu S12572-050P, 4 per side in series

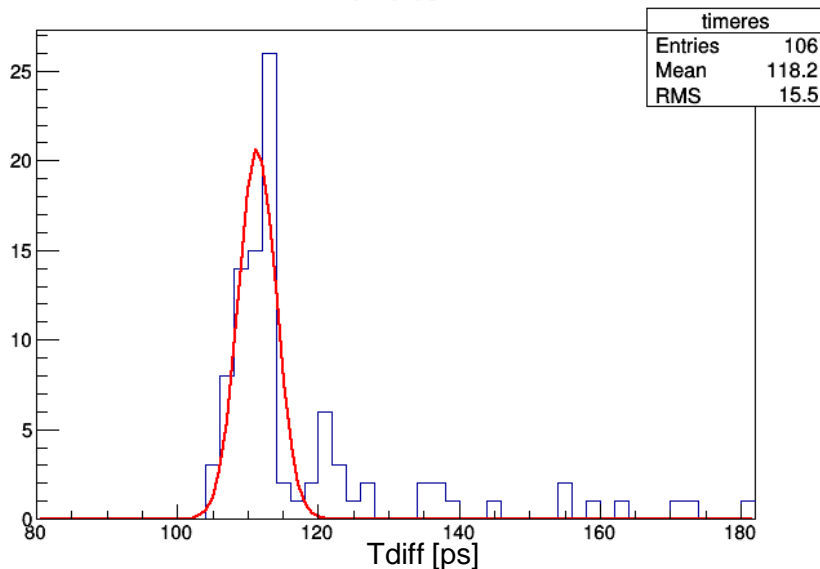
| | Unwrapped 4V | Unwrapped 6V | Paper 4V | Paper 6V |
|-------|-----------------|-----------------|-------------|-------------|
| BC420 | 93 ± 4 | 72 ± 3 | 84 ± 3 | 68 ± 2 |
| BC418 | 92 ± 3 | 74 ± 2 | 79 ± 2 | 67 ± 2 |
| BC408 | 135 ± 4 | 95 ± 2 | - | - |

- Time resolution of BC408 worse than BC418 and BC420
- No significant difference between BC418 and BC420

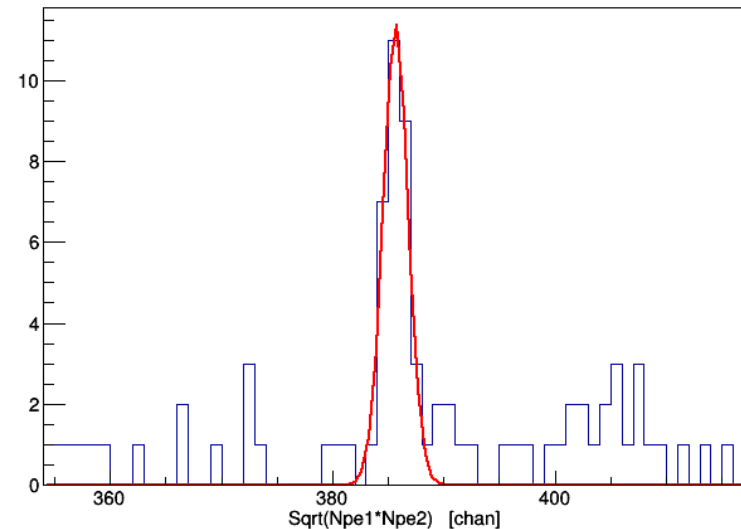
SciRod thickness

- Sensor: Ketek PM3350TP-SB0, 4 per side in series, 150 V
- Scintillator: BC418, 5x3x0.5 cm, wrapped in paper

timeres



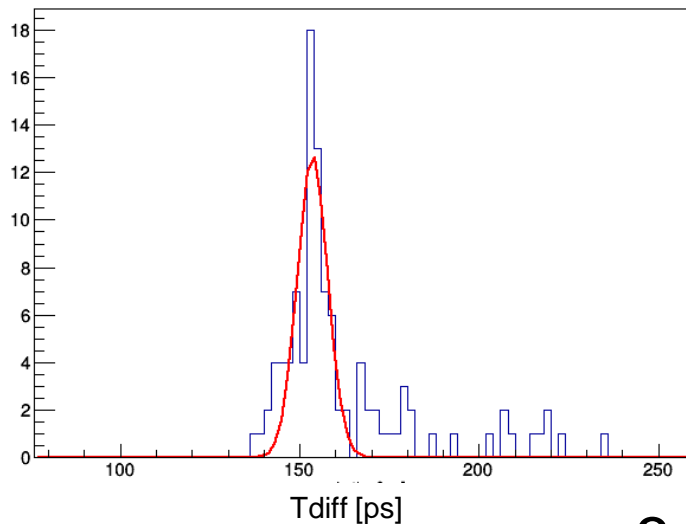
NpeDt



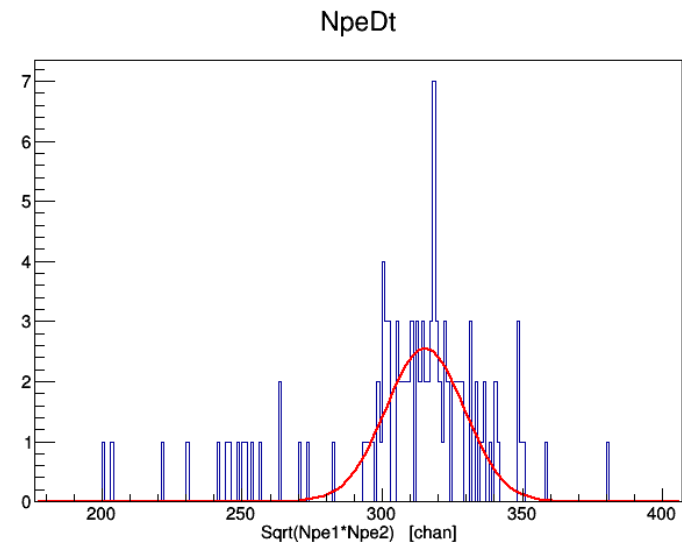
5mm:
 56 ± 2 ps
 386 ± 11

SciRod thickness

- Sensor: Ketek PM3350TP-SB0, 4 per side in series, 150 V
- Scintillator: BC418, 5x3x0.3 cm, wrapped in paper



3mm:
 77 ± 2 ps
 315 ± 14



5mm:
 56 ± 2 ps
 386 ± 11

Outlook

- Todo:
 - Compare Ketek with Hamamatsu sensors
 - High rate test with laser or proton beam
 - Beam time at CERN, test particle identification

