



Characterization of Polycrystalline CVD Diamond Detectors with the Munich Heavy Ion Microscope SNAKE

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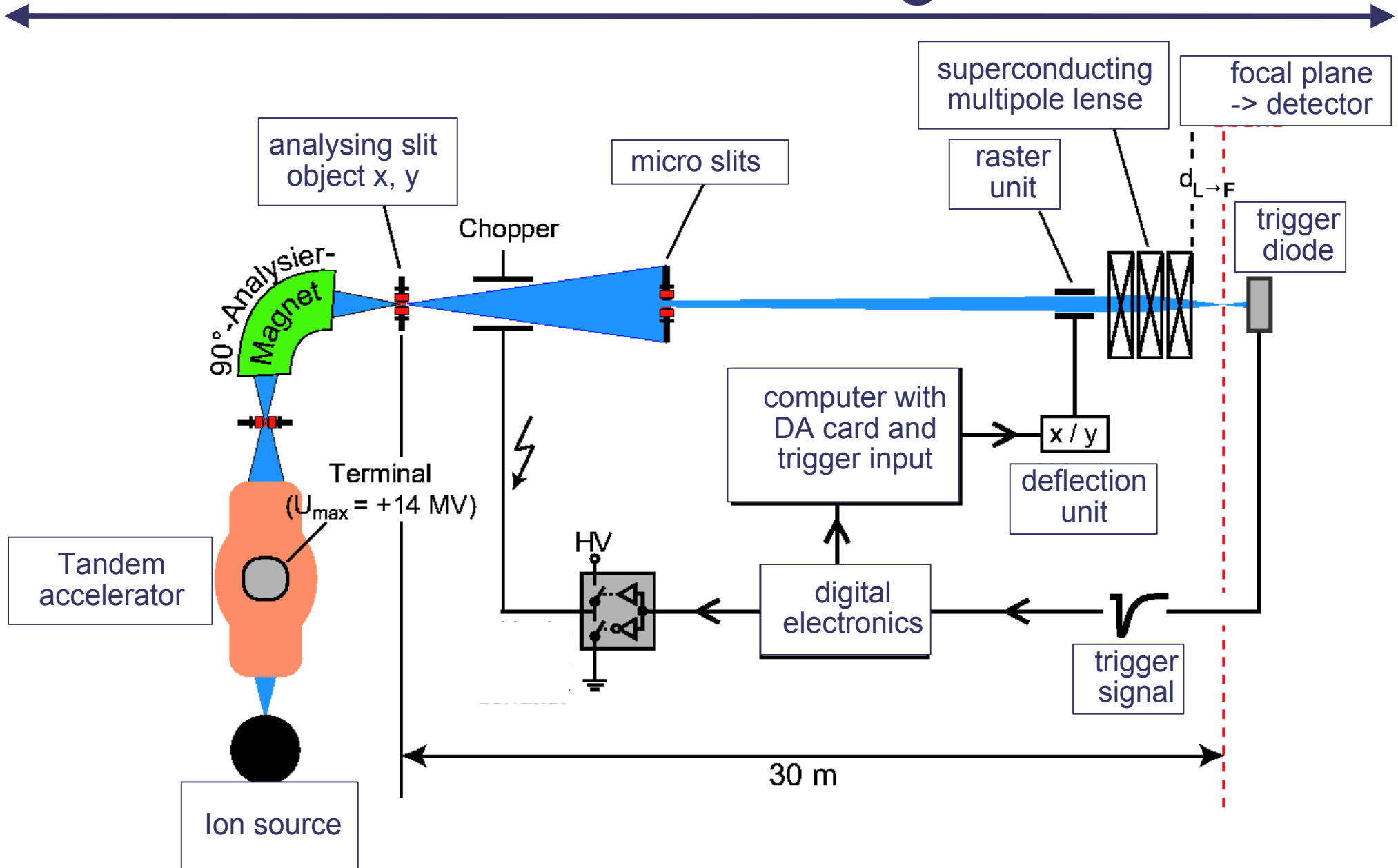
R3B/EXL Workshop 2006

SNAKE

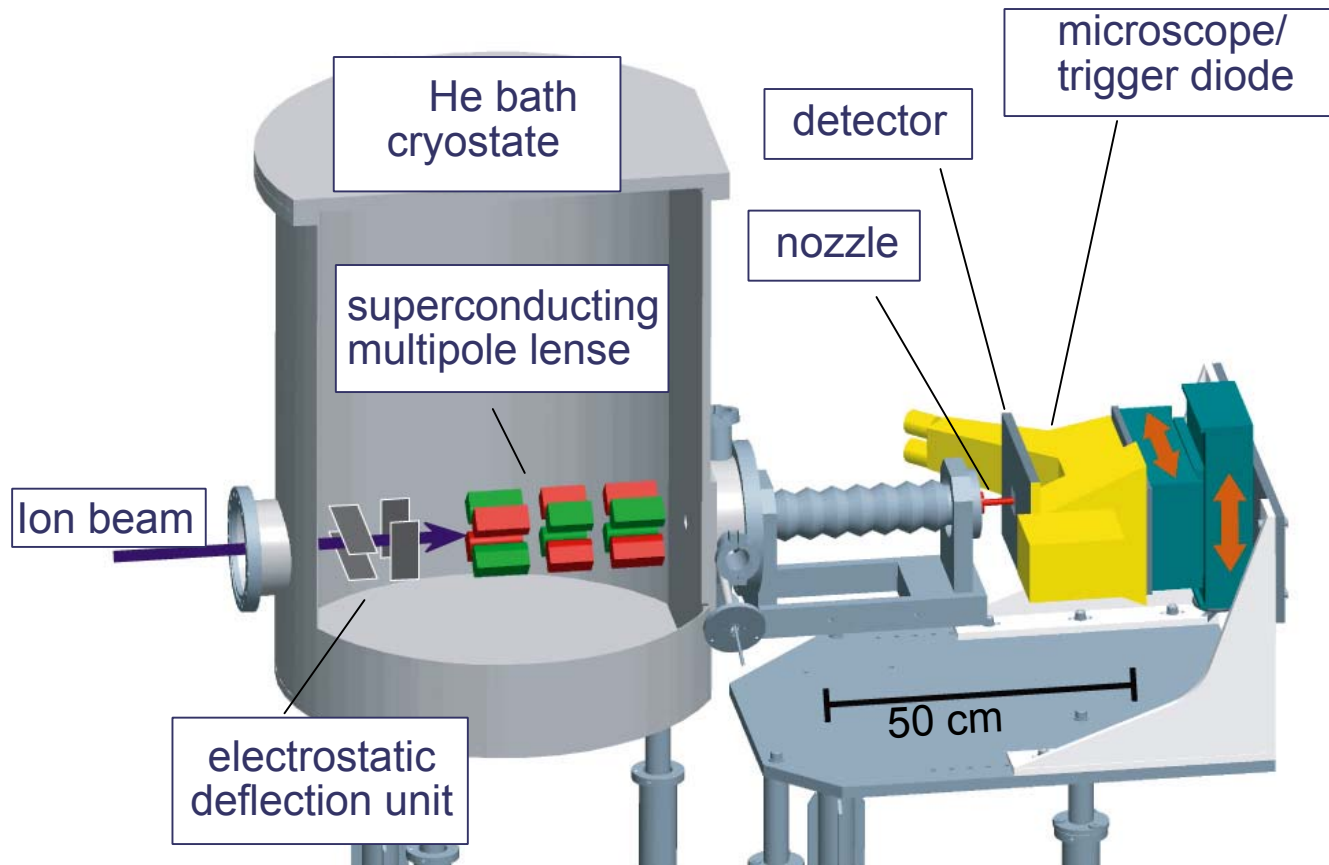
Superconducting Nanoscope for Applied nuclear physics (**K**ernphysikalische) **E**xperiments

- ◆ Ion beam with a diameter of about 1 μm
 - 48 MeV Li
- ◆ Scanning point by point
 - 60 x 120 points
 - 128 particles per point
- ◆ Increments
 - rough scan: 10 μm in x-, 5 μm in y-direction
 - fine scan: 3 μm in x-, 2 μm in y-direction
- ◆ Trigger signal from a Si diode

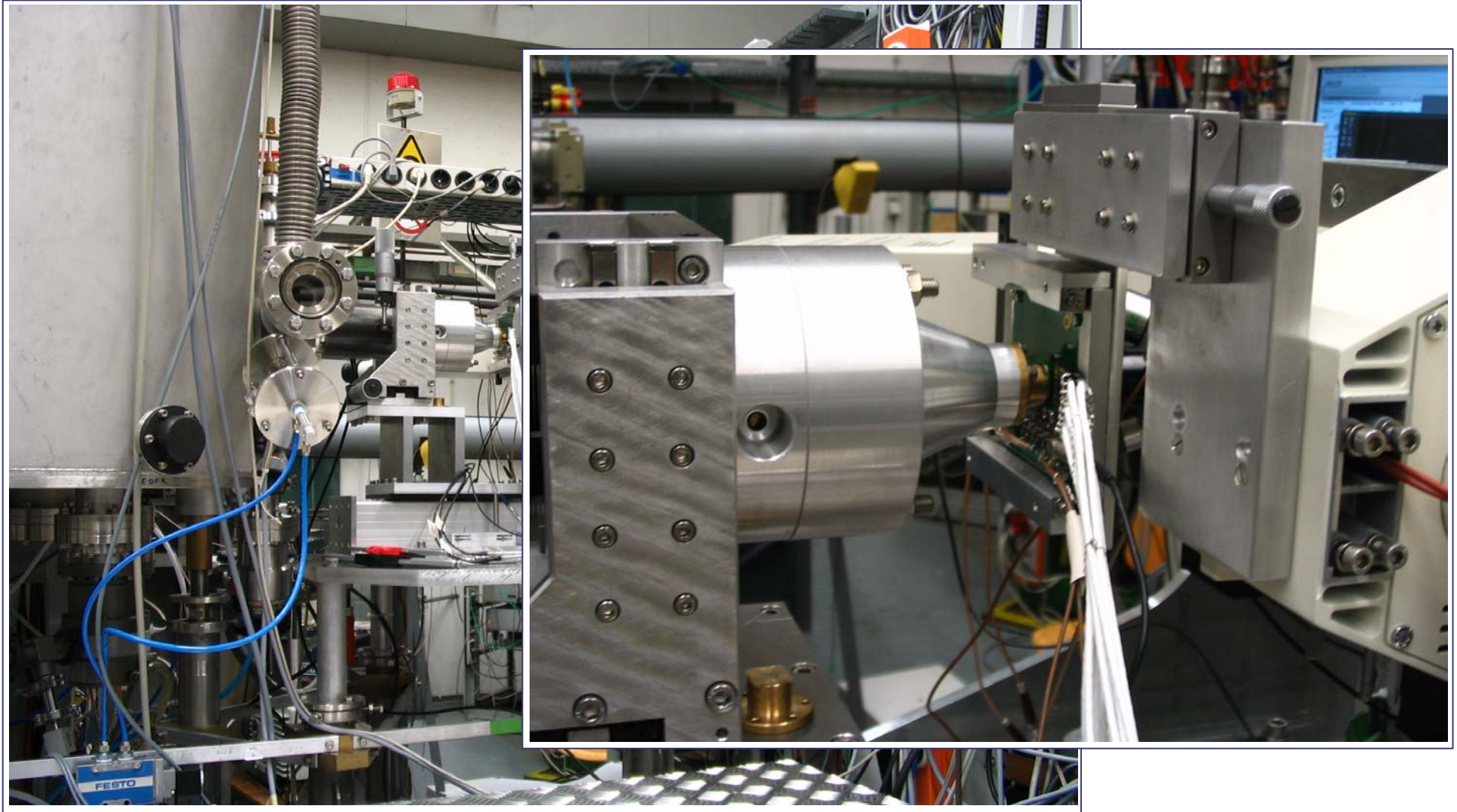
SNAKE - Beam alignment



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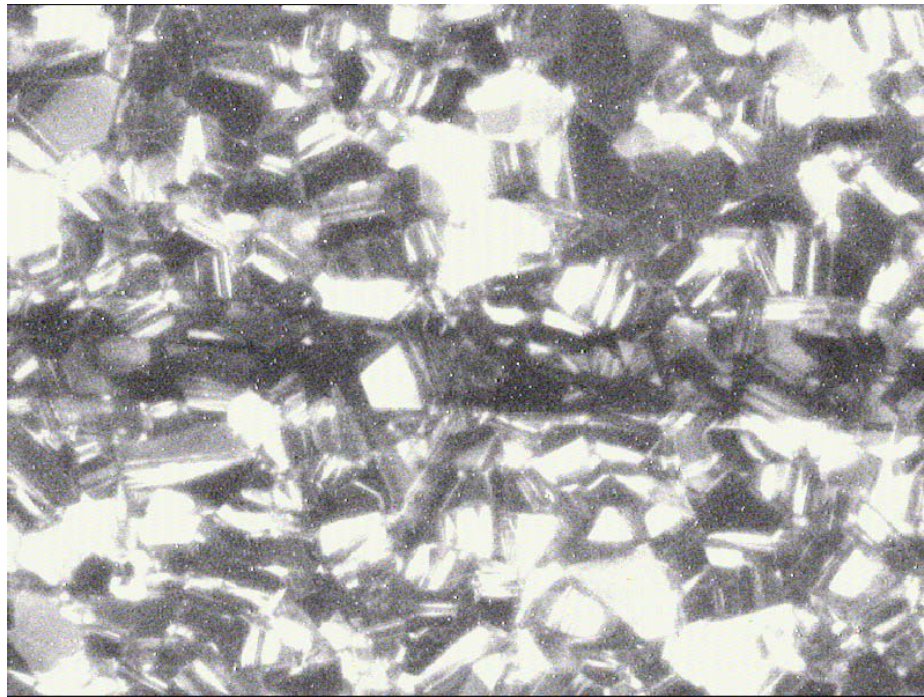


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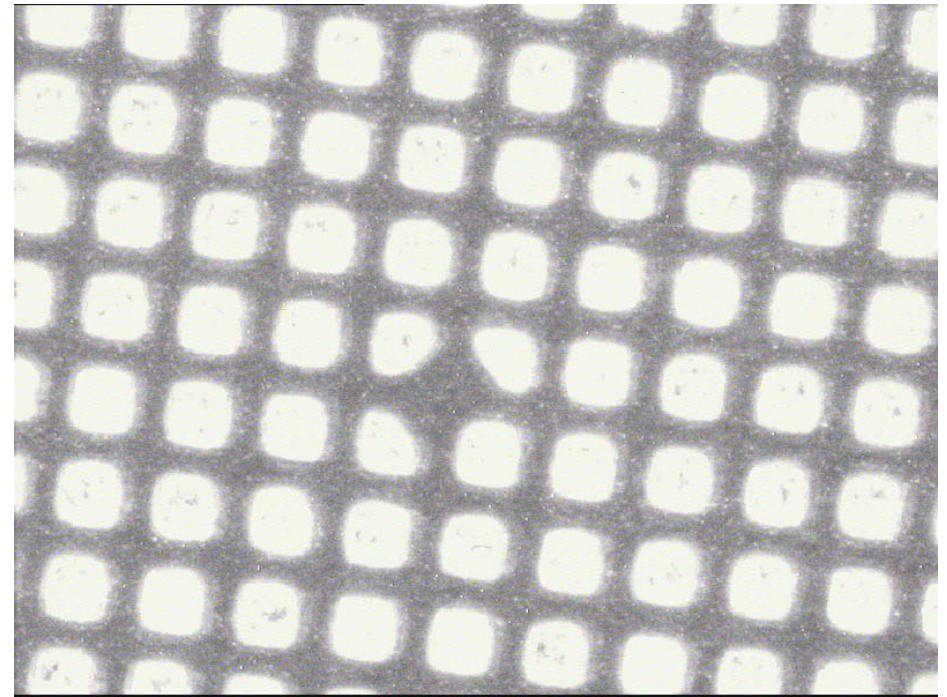
Resolution and calibration

Diamond substrate as grown



↔
50 μm

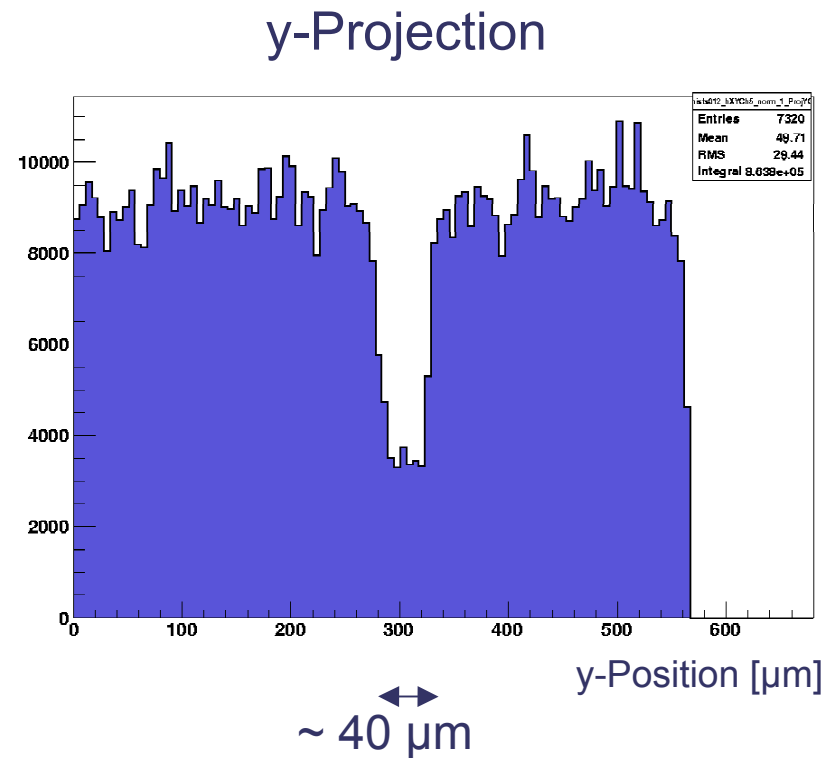
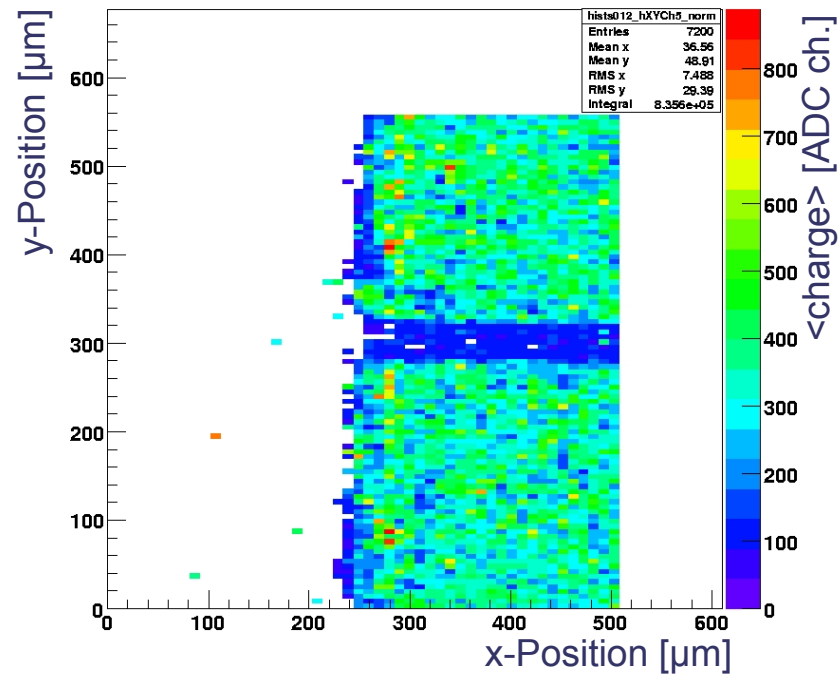
Metal grid



↔
50 μm

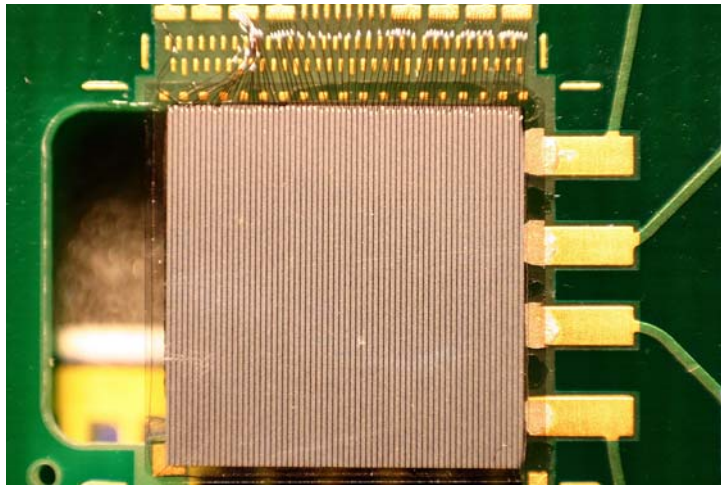
Signal map

rough scan: 505x560 μm^2
4x4 2mm strips

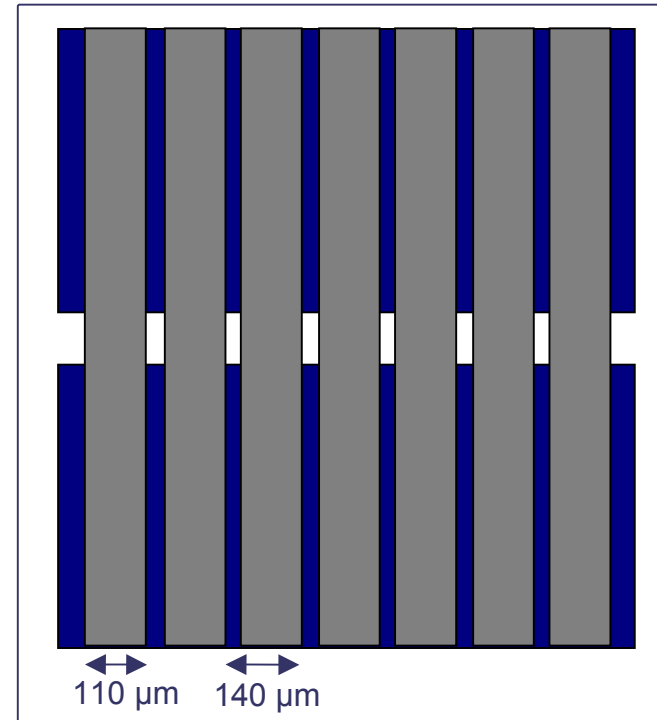


IAF, 50 μm

Fine pitch detector



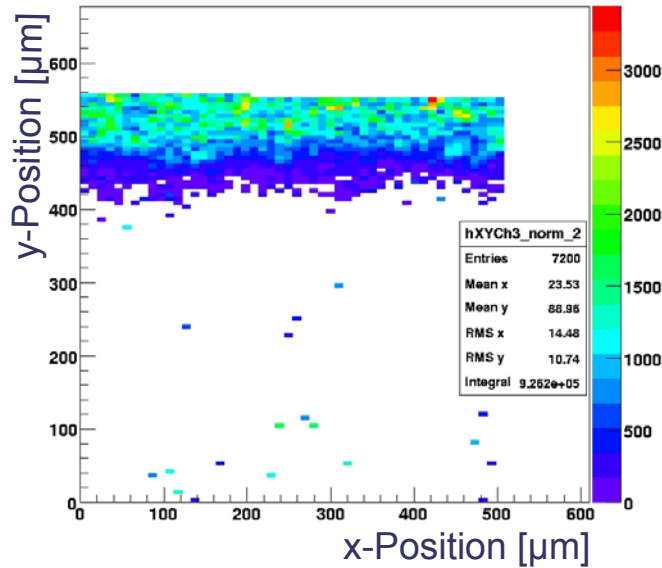
E6, 120 μm , 64
110 μm strips,
30 μm gap



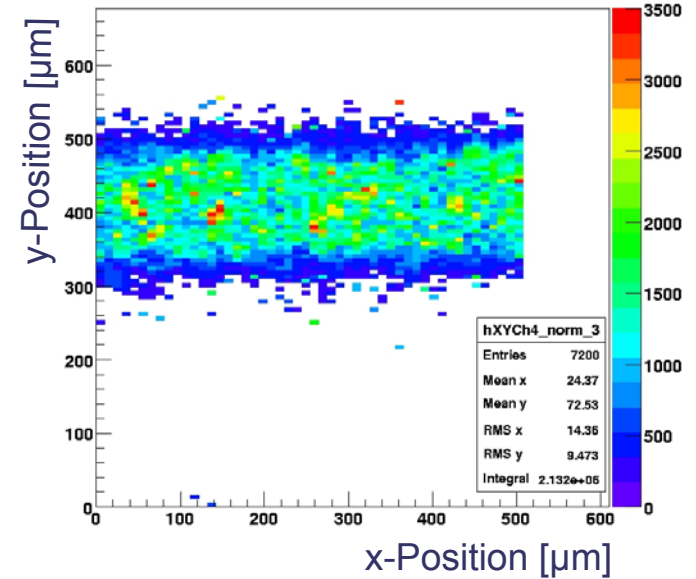
Fine pitch detector

Overview scan

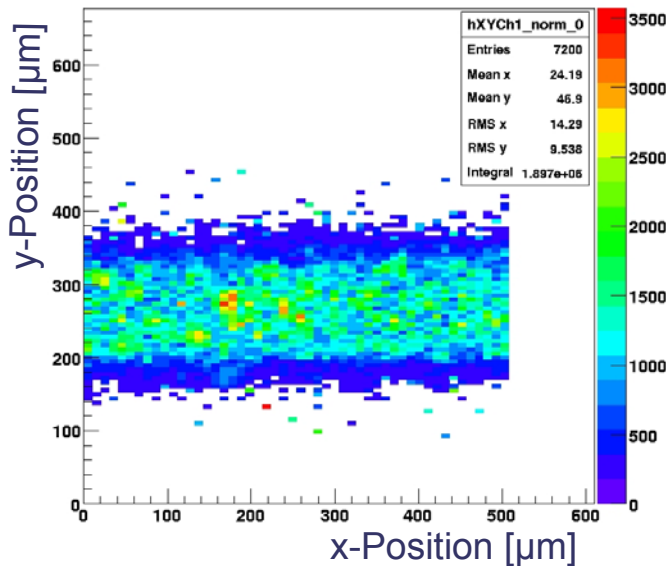
strip 1



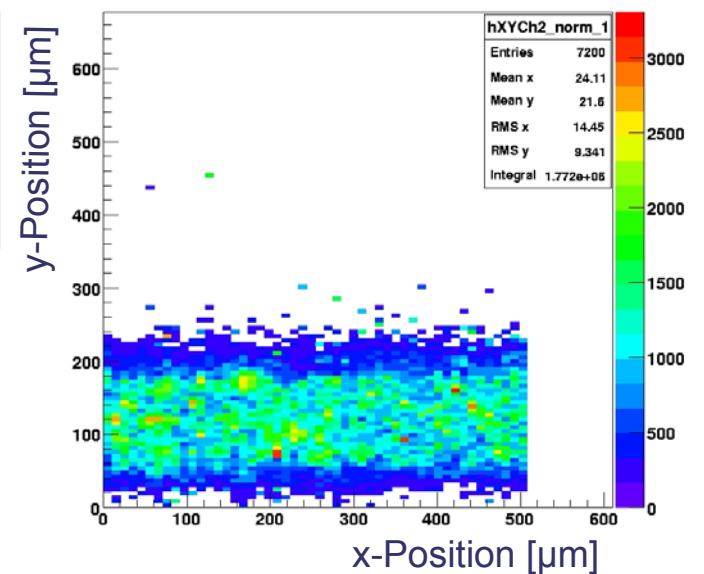
strip 2



strip 3



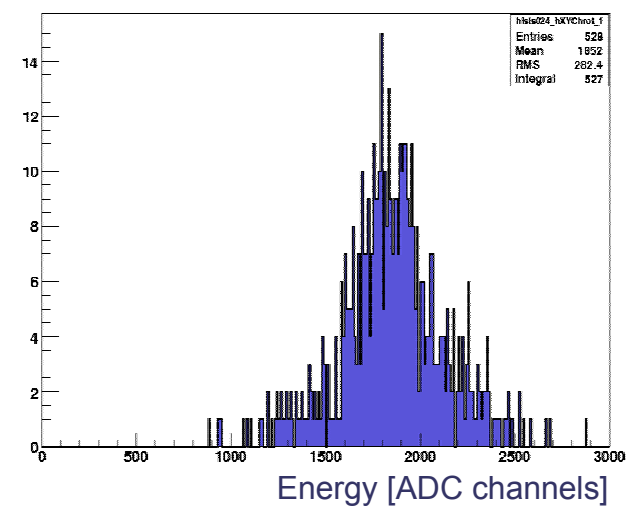
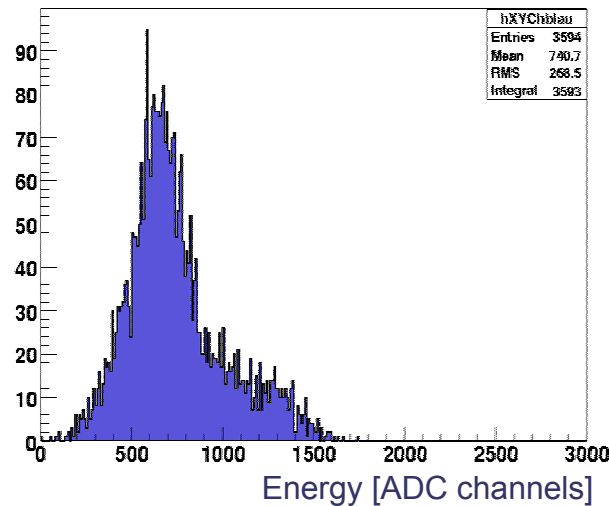
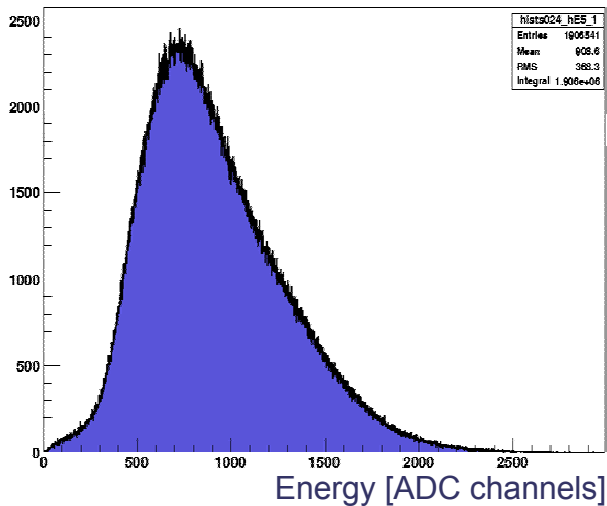
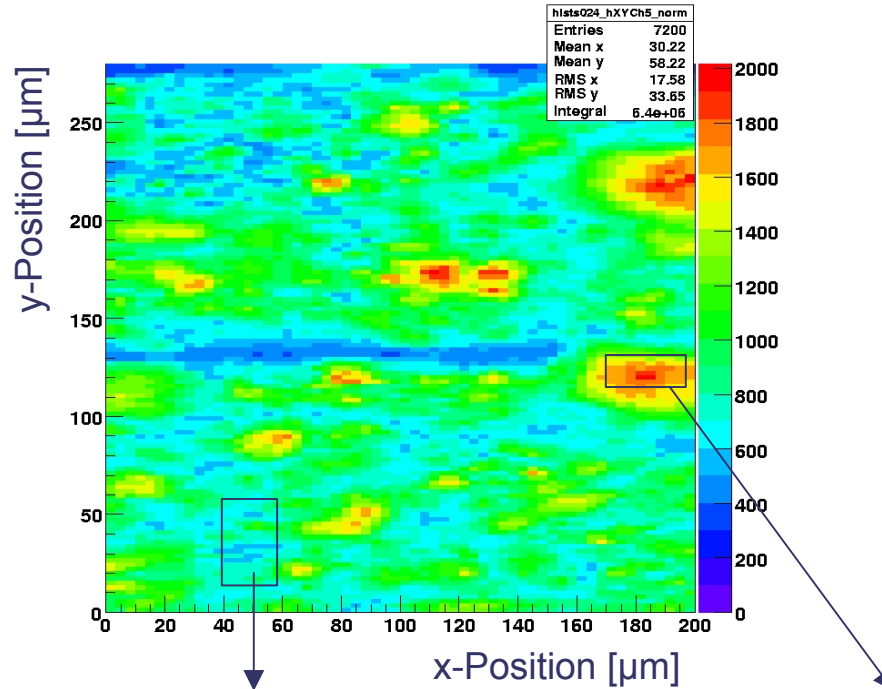
strip 4



E6, 120 μm,
64x4 strips

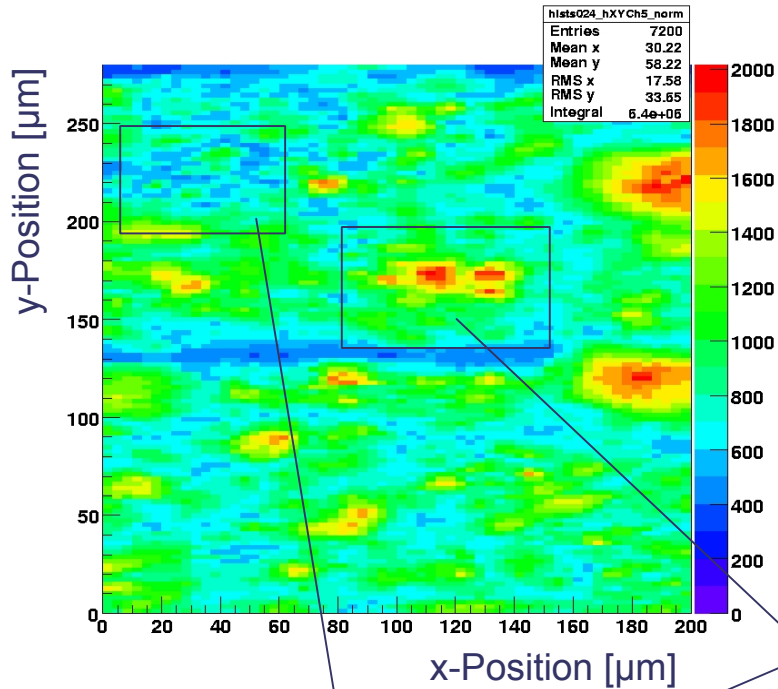
Local energy distribution

E6, 120 μm ,
64 strips,
fine scan



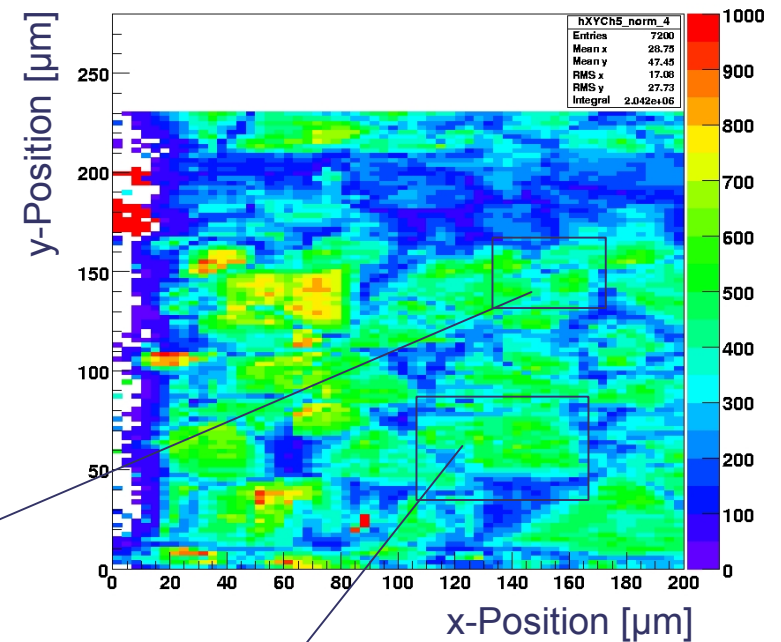
Crystallite size (fine scan)

120 μm



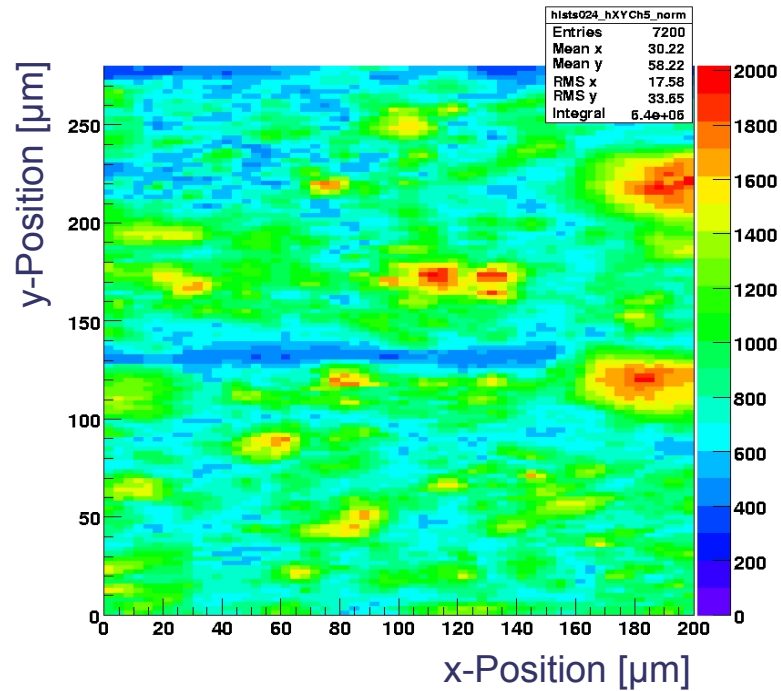
small crystallites of
about $20 \times 20 \mu\text{m}^2$

50 μm

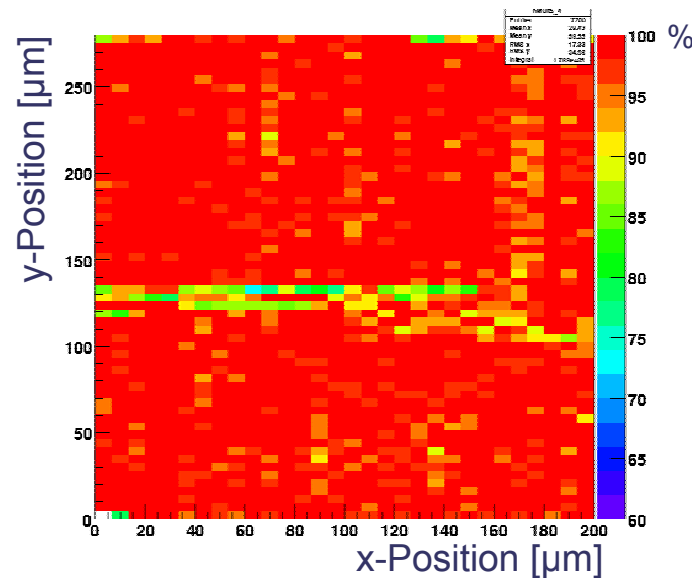
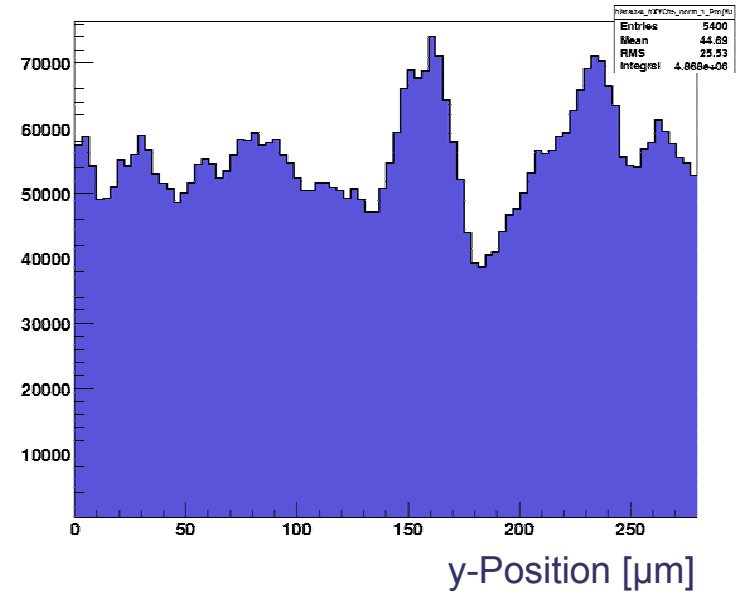


large crystallites
up to $50 \times 70 \mu\text{m}^2$

Signal map (fine scan)



y-Projection



~ 20 μm

↳ = gap – 10 μm

E6, 120 μm,
64 110 μm strips,
30 μm gap