



**HELMHOLTZ
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für Materialien und Energie

Polycapillary lens for tomography

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Requirements for a neutron beam focusing for tomography (17.3.3)

1. Focus of 1 mm diameter

This determines the resolution

2. Homogeneous intensity distribution

No structure should be introduced by the focusing device and possible inhomogeneities, e. g. from holes in the guide, should be washed out.

3. Divergence of 2.5°

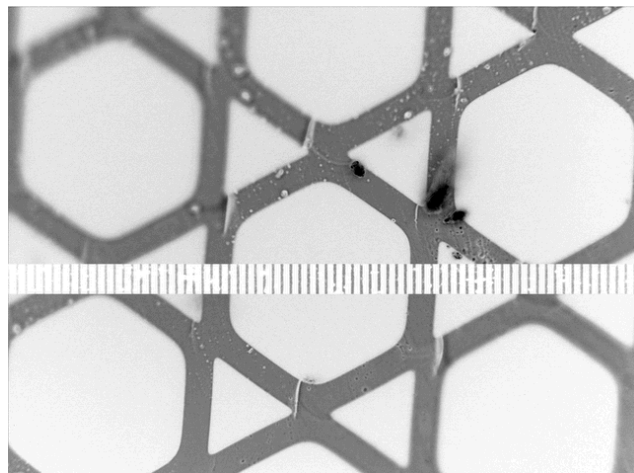
This should cover a 200 mm detector after a flight path of 5 m

Capillary lens

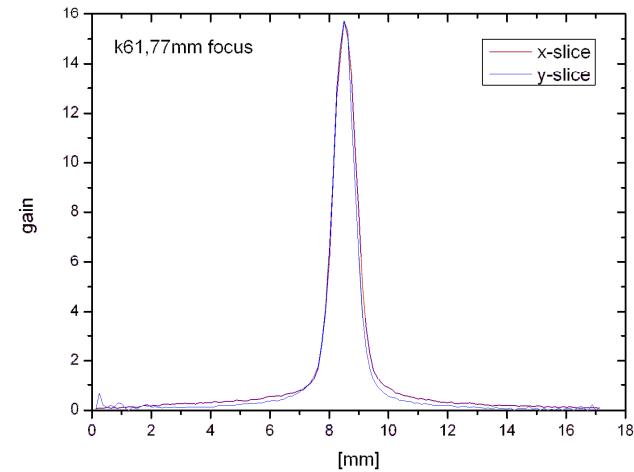
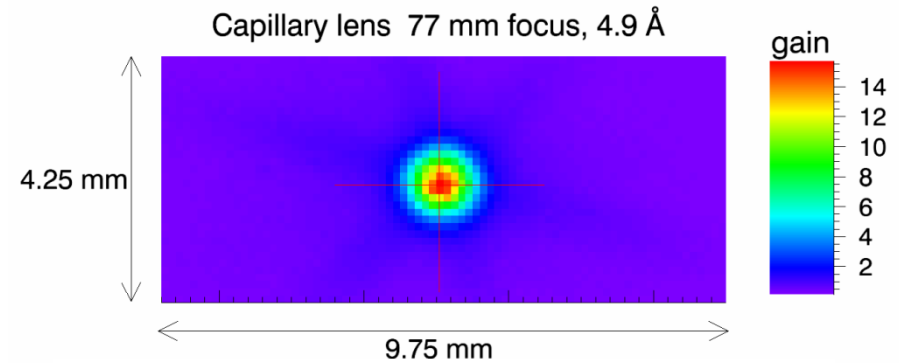
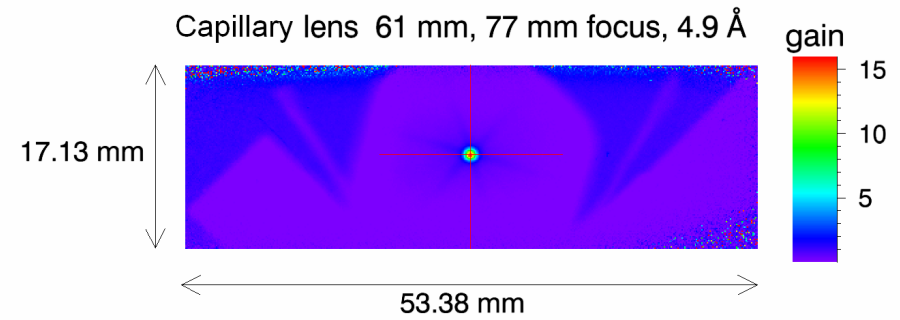
PSD



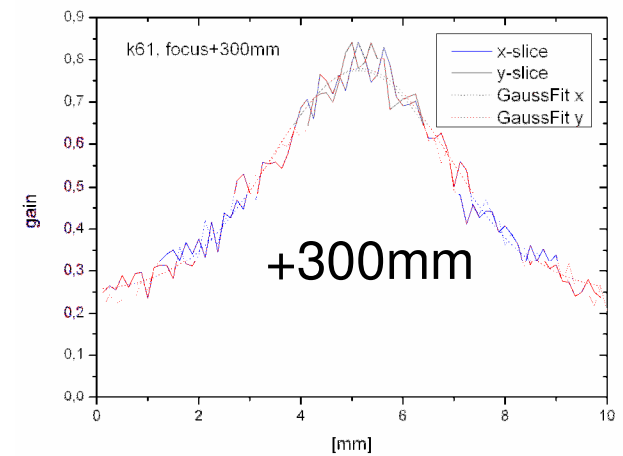
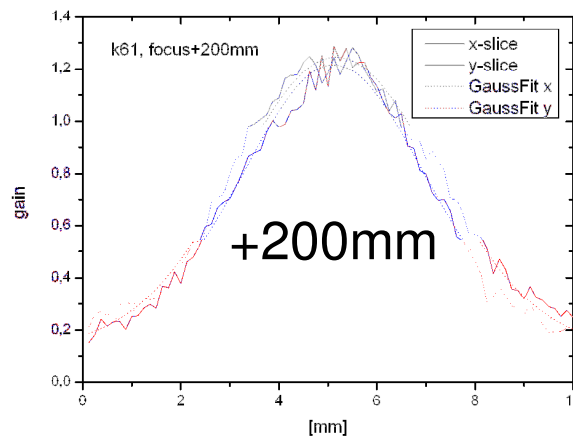
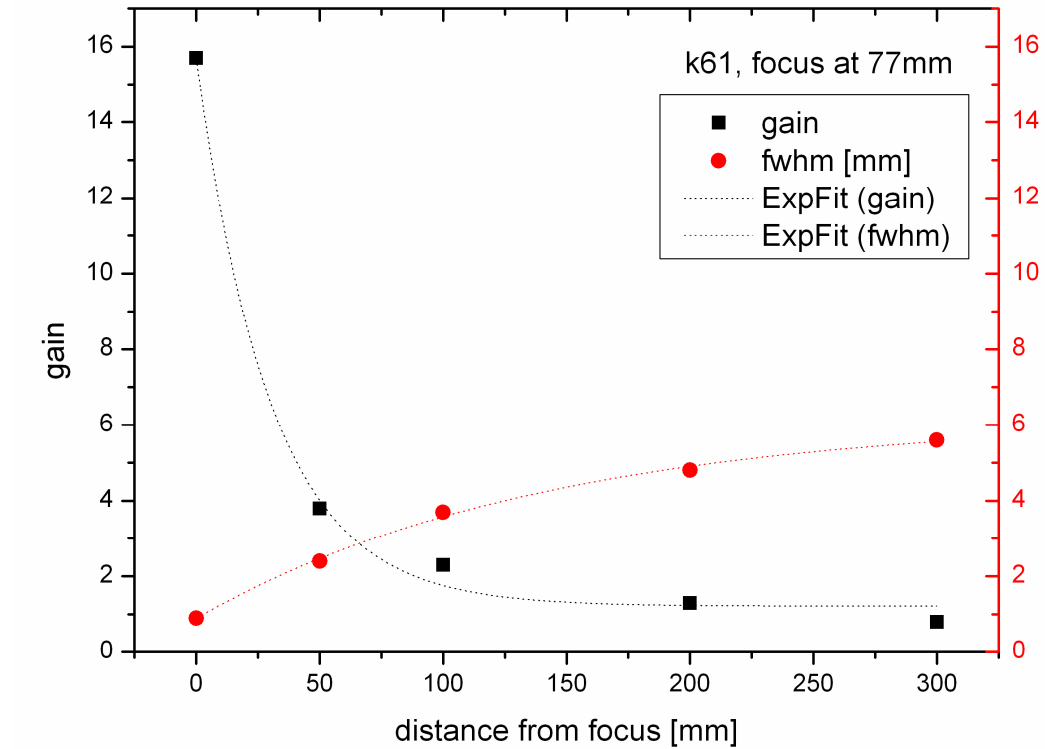
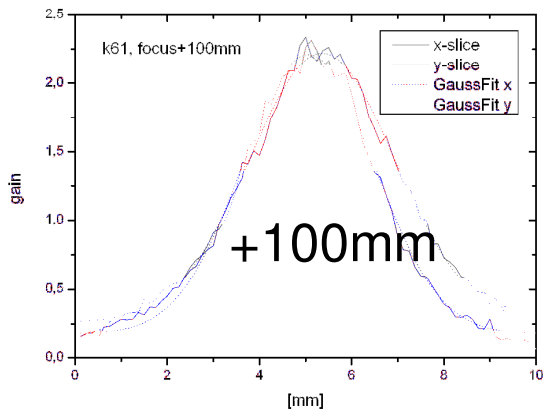
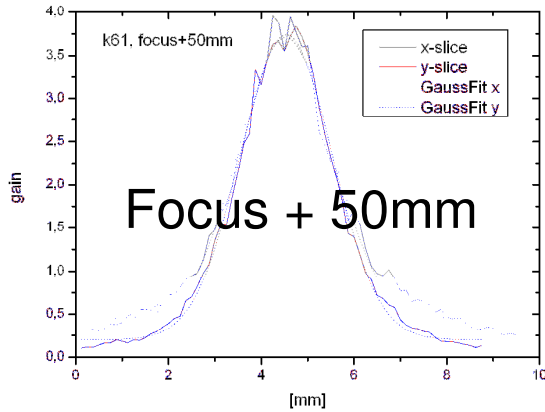
Lens length: 61mm, focus: 77mm



Capillaries: 41 μ m \rightarrow 34 μ m
Lens diameter: 20mm \rightarrow 17mm



Capillary lens results



Properties of polycapillary lenses

1. Focus of 1 mm diameter

Is possible, reported values are down to 0.1 mm

2. Homogeneous intensity distribution

The experimental values look promising, has to be tested at the tomography instrument.

3. Divergence of 2.5°

This is possible, also higher values are no problem.

The polycapillary lens should be able to fulfil the requirements of the tomography.