IMAGING WITH THICK PLAN CONVEX LENS

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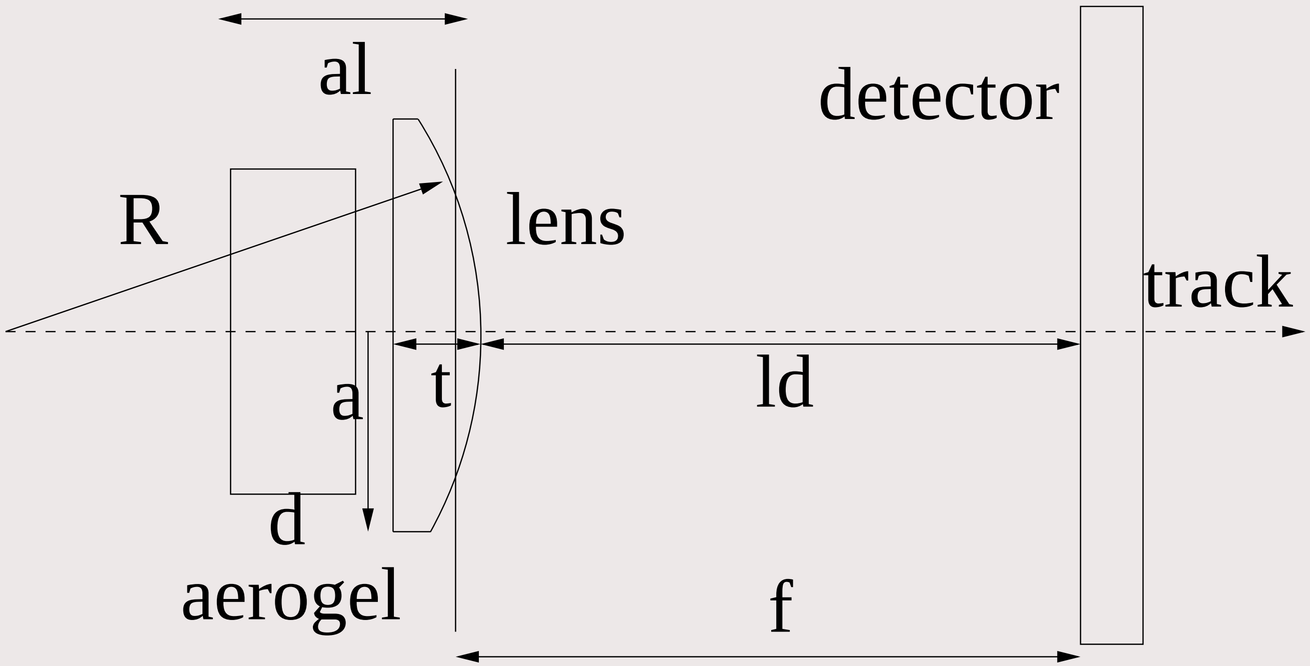
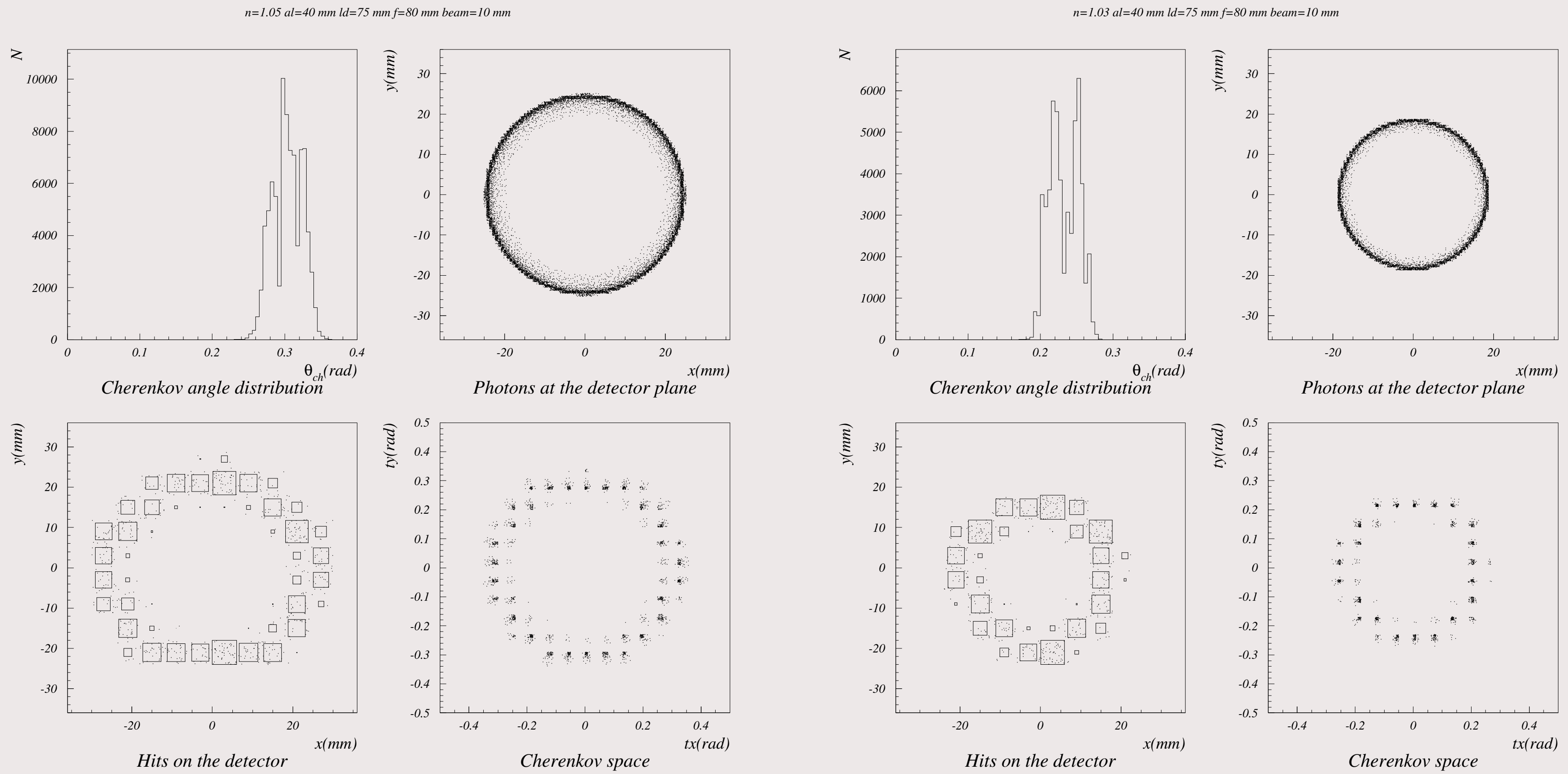
- Setup parameters
- Different aerogel n
- Lens Focal length variation
- Distance Aerogel-Lens variation

Setup parameters



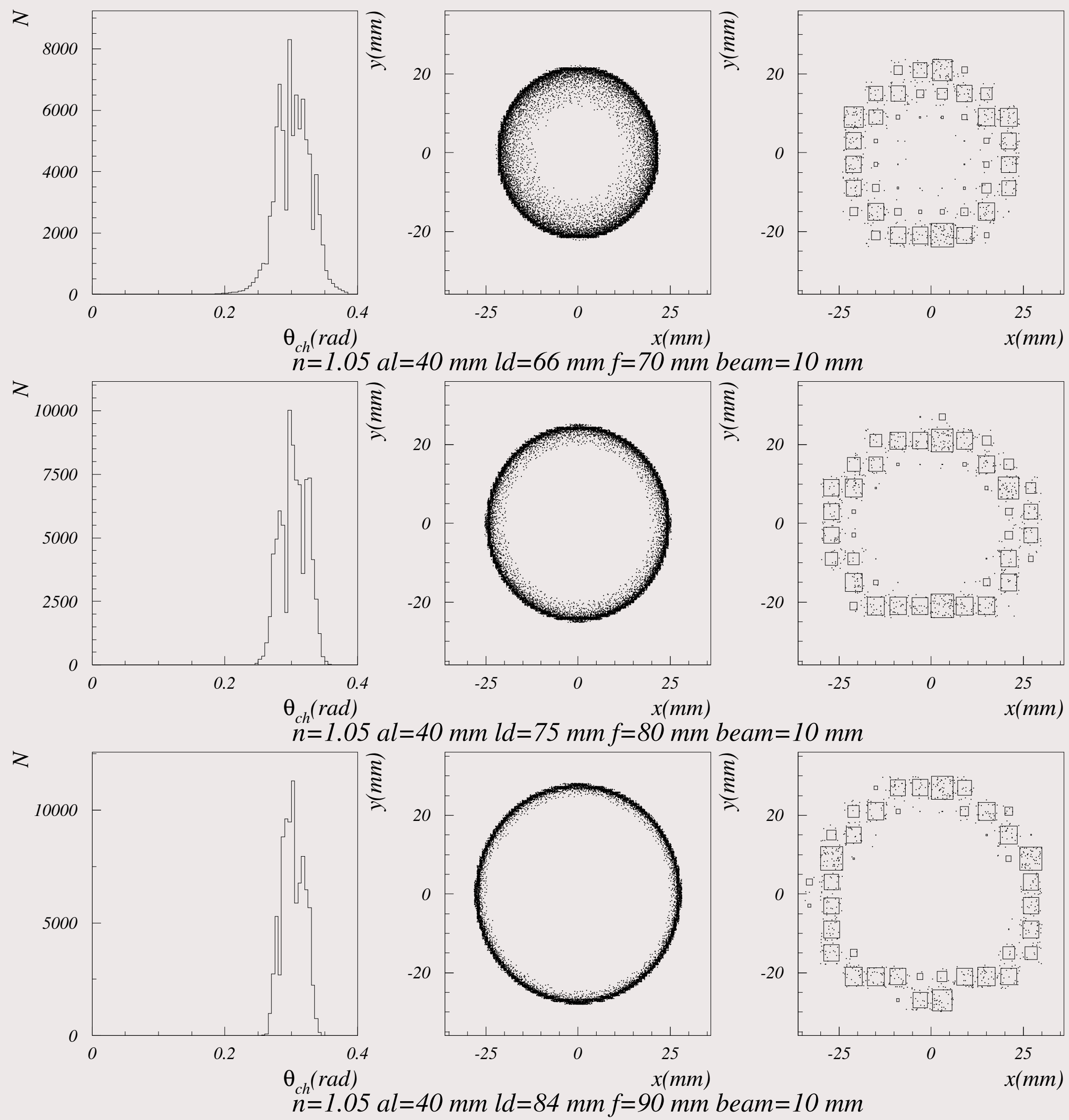
- Plan convex lens with refractive index n=1.5 and thickness t=18.5 mm
- radius of curvature of the lens surface r
- aerogel thickness d=20 mm
- lens position after aerogel (al=20 mm)
- Aperture of the lens 2a=50 mm
- Detector 12x12 pads with size of 5.1 mm$\times$5.1 mm
- positioned in the focal plane f of the lens (distance from the exit plane ld)

Different aerogel n



- Imaging of the photons radiated from diffrent aerogels n=1.05 and n=1.03
- Note: Reconstructed Cherenkov space and Digitized hits nearly equal (lens acts as FFT: angles → position)

Lens Focal length variation



Rows correspond to different lens focal length f=7, 8, 9 cm

- Each row: Reconstructed Cherenkov angle distribution, Photons at the detector plane, Digitized hits on the detector.
- f=7 cm image too small
- f=9 cm image too big, already on the border channels
- f=8 cm image OK

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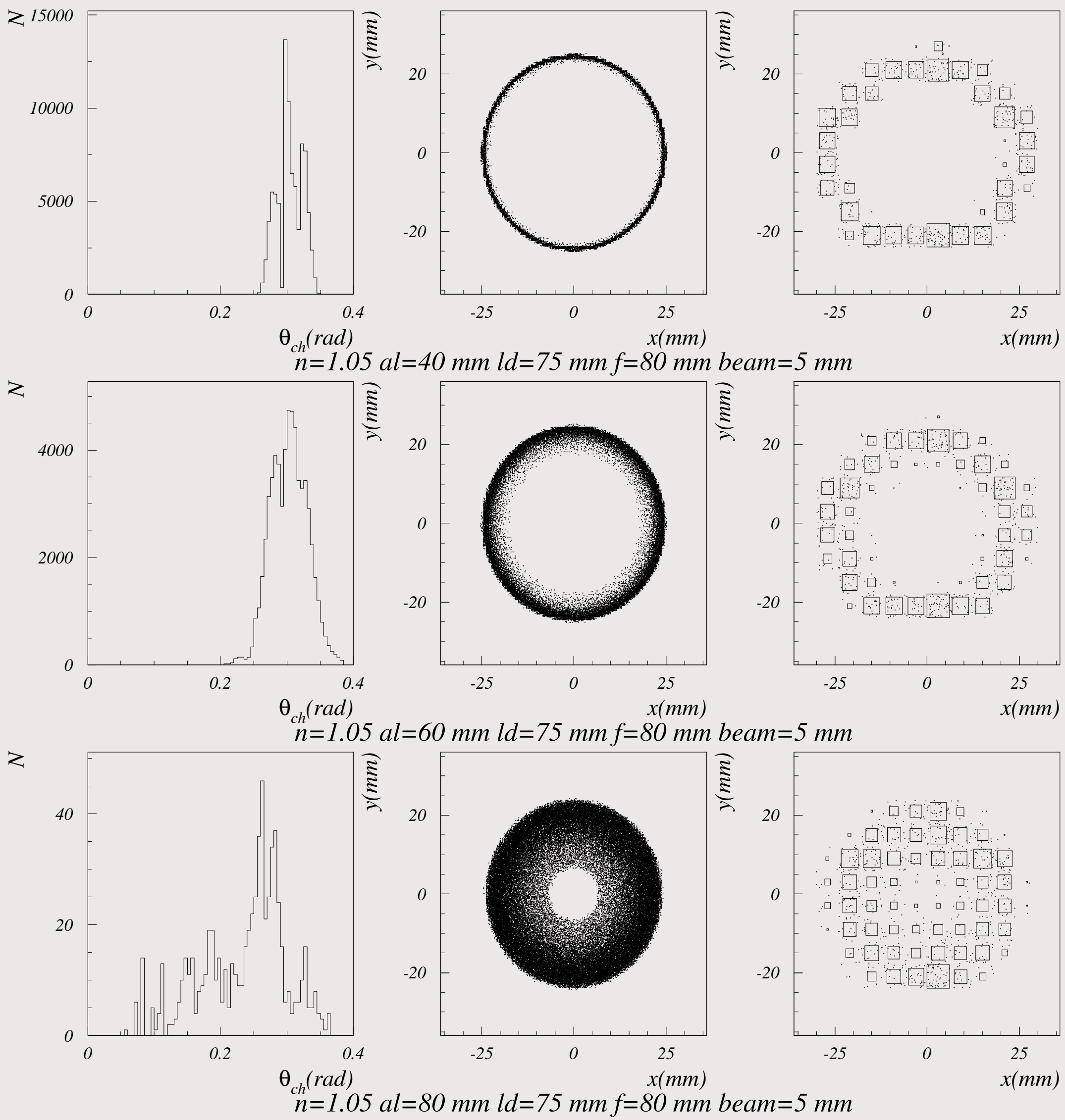
Distance Aerogel-Lens variation

Rows correspond to aerogel lens distances f=0, 2, 4 cm

- Each row: Reconstructed Cherenkov angle distribution, Photons at the detector plane, Digitized hits on the detector.
- Increase of lens aerogel distance causes more photons to hit the lens far from beam axis →
- non ideal optics



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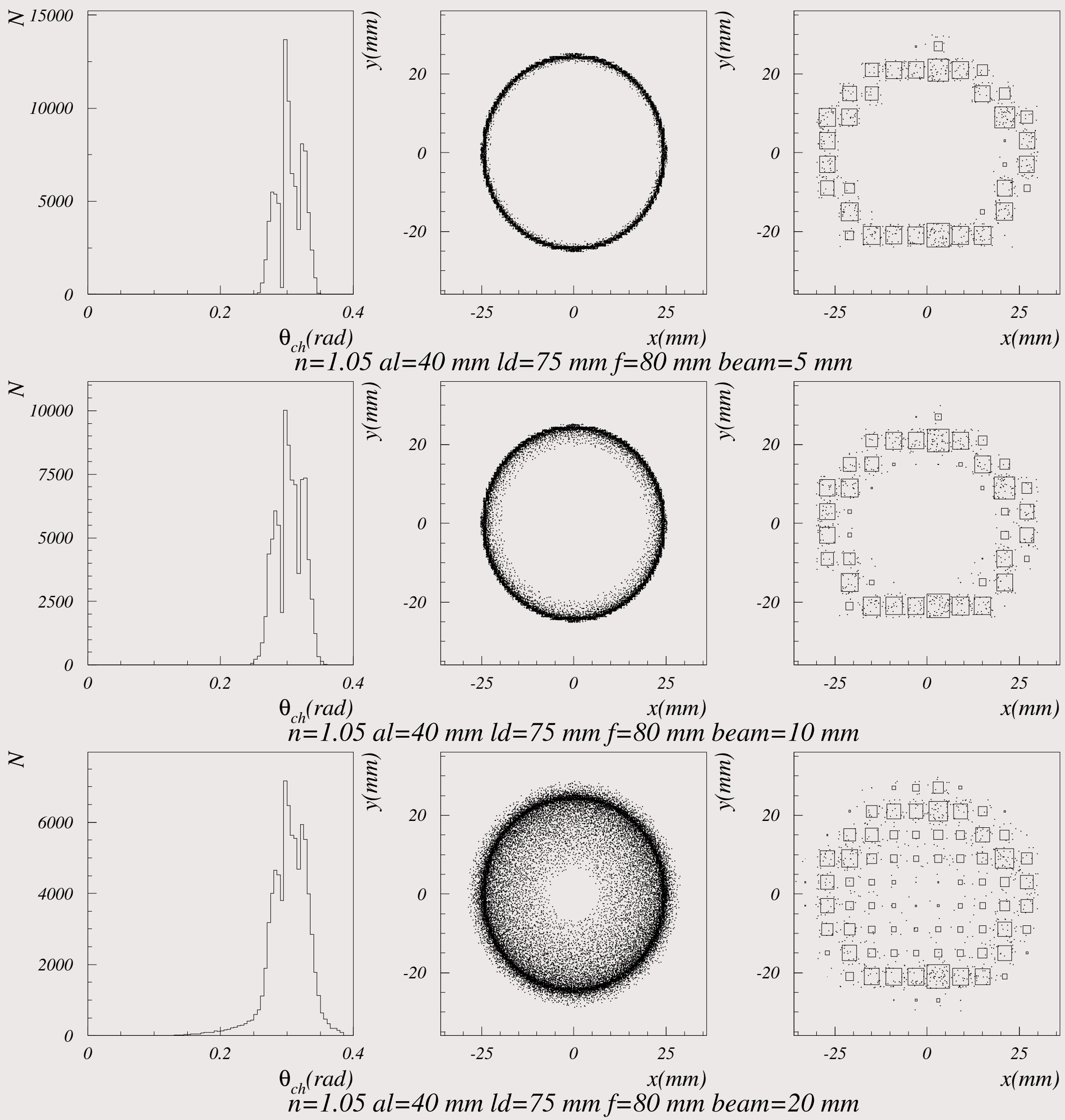
Particle impact point variation



Particles generation uniform on the disc with radius a=5, 10, 20 mm

- Each row: Reconstructed Cherenkov angle distribution, Photons at the detector plane, Digitized hits on the detector.
- Little but still acceptable distortion for beam area size 20 mm