MIRACLES general layout
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Horizontal Profile
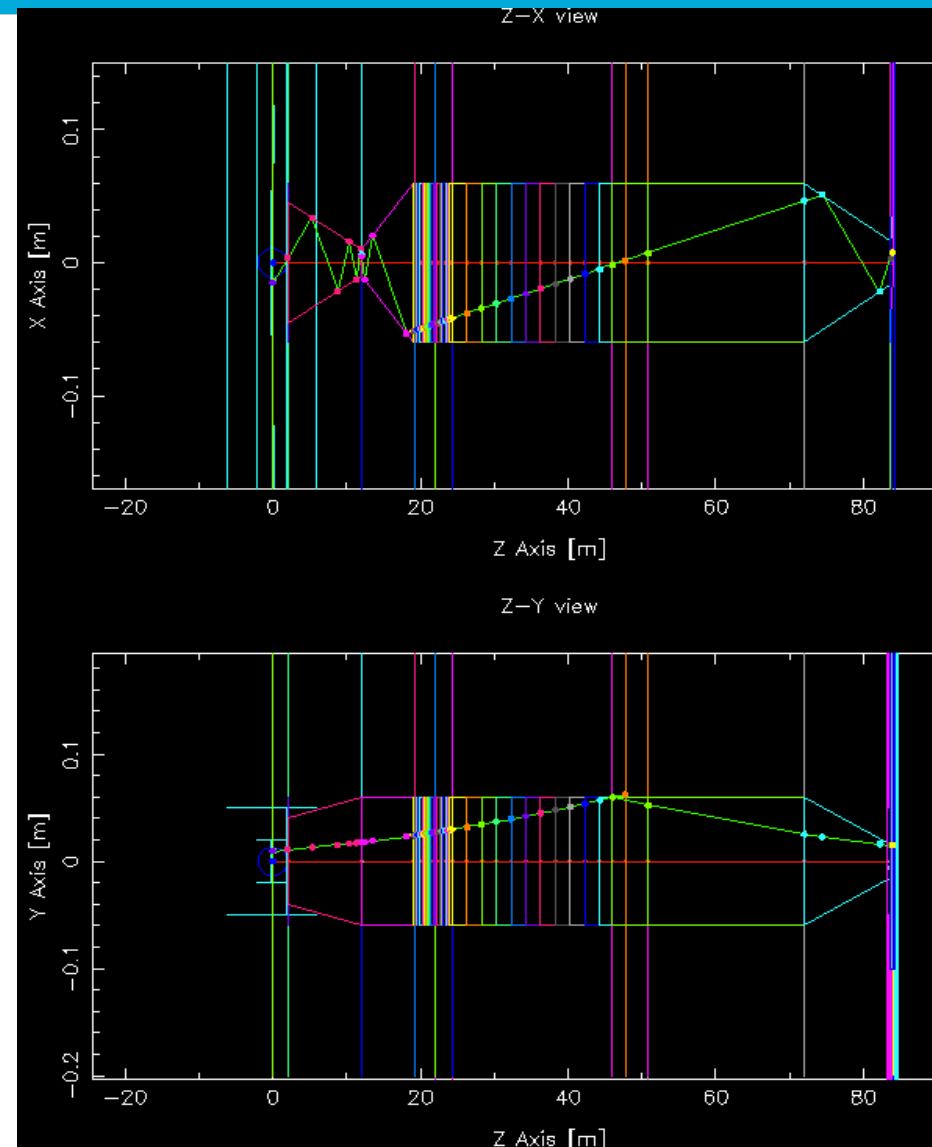
Length: 84m
Moderator - Guide Entrance: 2m
Divergence at sample: +-2.5 deg
Sample size: 3x3 cm^2
Wavelength : 6.27Å Δλ=1 Å

Straight Guide: 12x12 cm^2, m=2
Converging Guides: m=3.6

Figure of merit:

$$fom(modh) = f_g(\lambda, modh) \times \frac{IF_p}{IF_c}$$

Vertical Profile

Vertical Plane Guide
Extraction part for a 3cm high moderator

Guide Entrance Height
Calculated Ideal Height 5.6 cm
Simulation Scenario A: 3 cm high
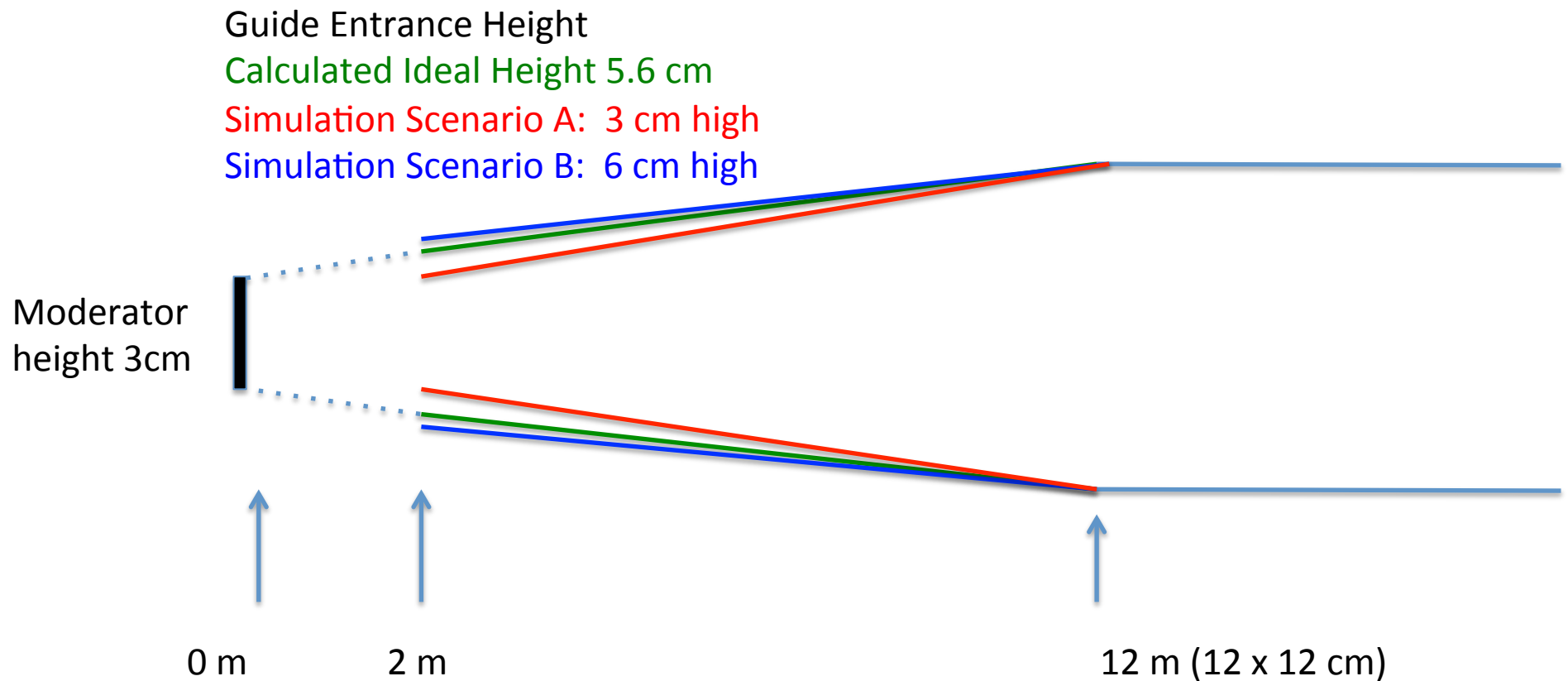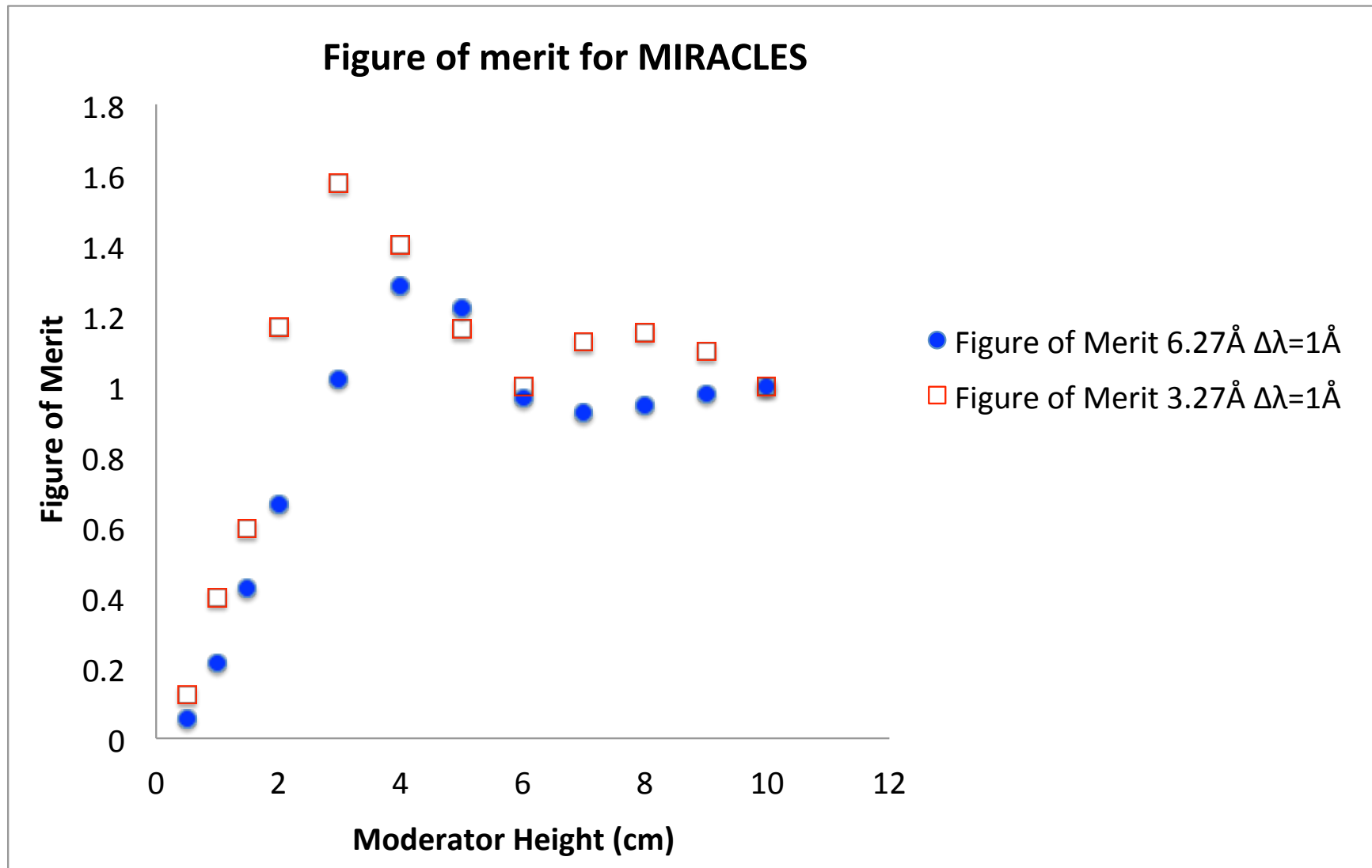Simulation Scenario B: 6 cm high

Moderator
height 3cm

0 m   2 m   12 m (12 x 12 cm)

Figure of Merit Miracles by simulation

Figure of merit for MIRACLES

- ● Figure of Merit 6.27Å Δλ=1Å
- □ Figure of Merit 3.27Å Δλ=1Å

X-axis: Moderator Height (cm)
Y-axis: Figure of Merit

Figure of Merit Miracles by simulation
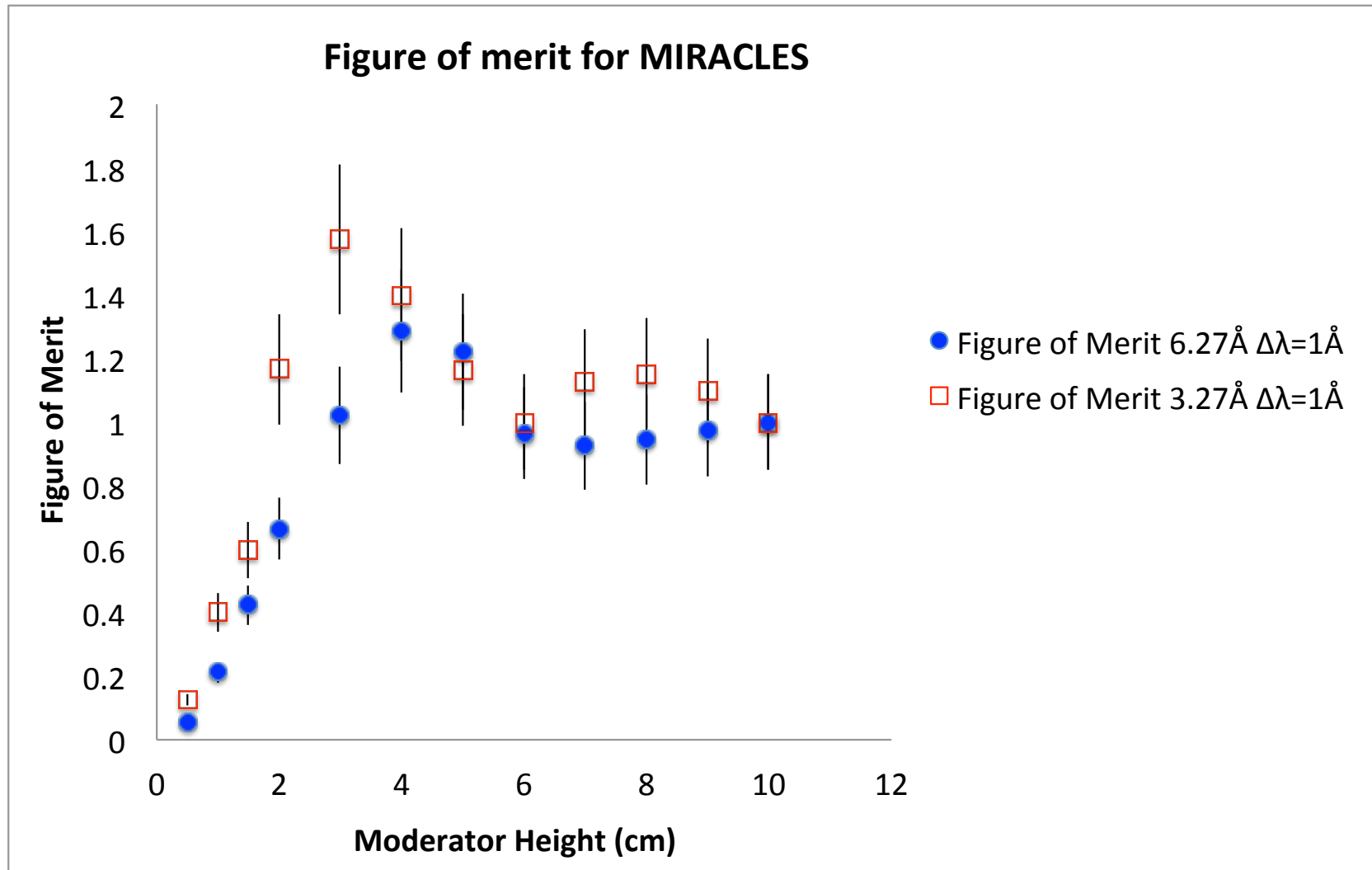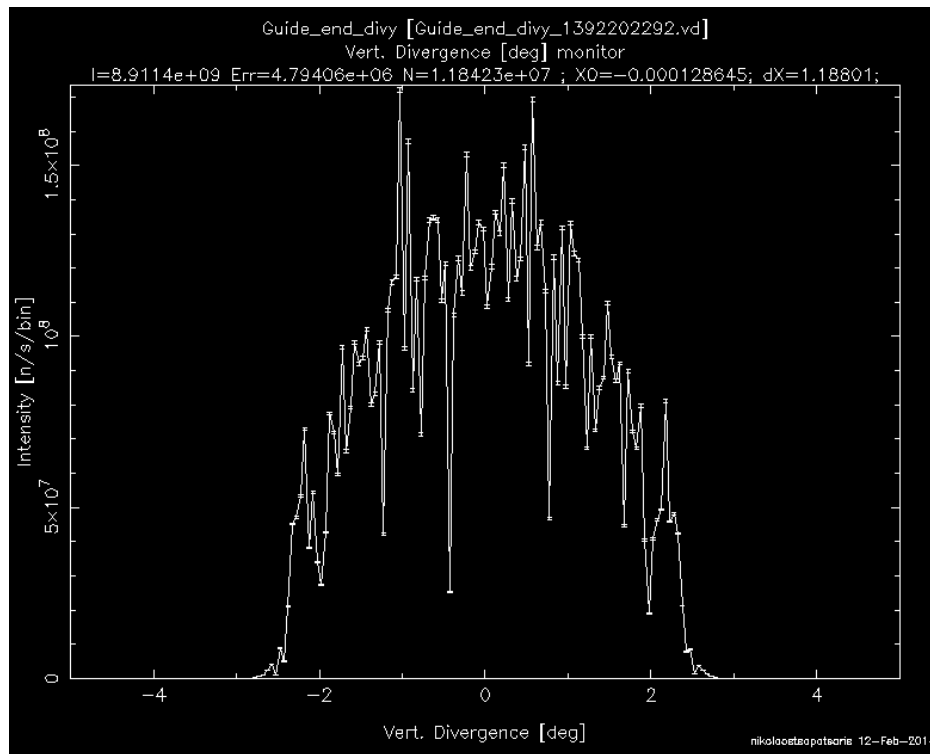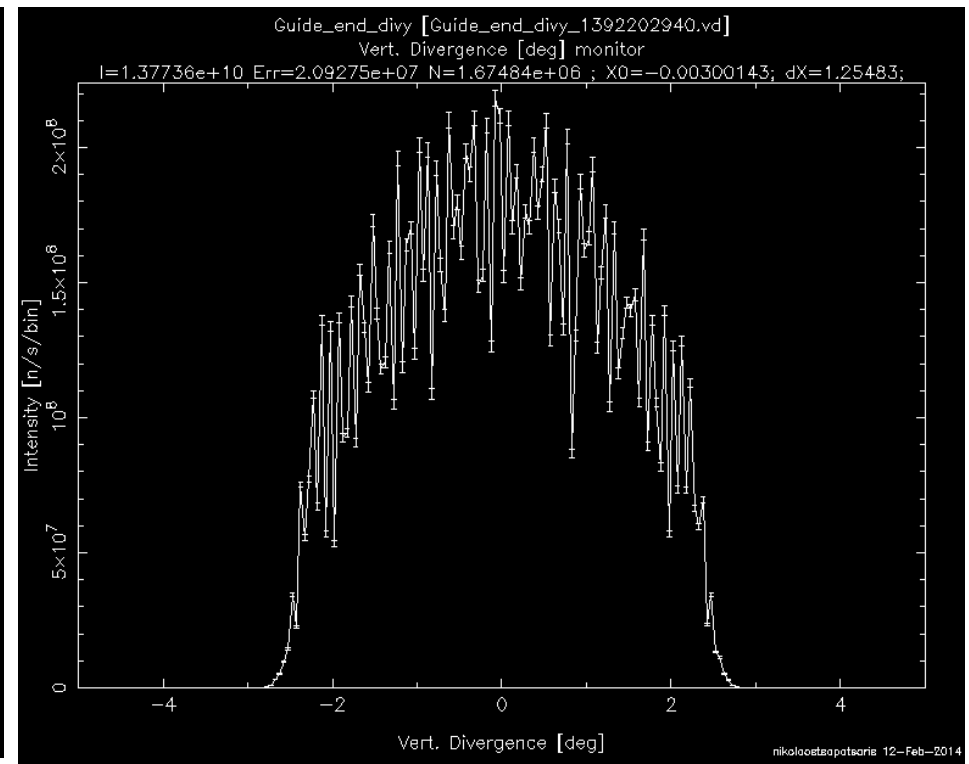

Figure of merit for MIRACLES

Vertical Divergence Profile

Moderator Height =4 cm

Moderator Height =10 cm

Divergence Profile

1. MIRACLES will not gain with a smaller moderator
2. Divergence may degrade
3. Significant losses below 3 cm

4. MCNPX: systematic errors?
5. Engineering uncertainties?15%

- Thank you for your attention

Figure of Merit Miracles analytics

$$\Phi = B \; x \; A_{mod} \; / \; L^2 \; x \; A_{in} \; / \; A_{sample}$$