Vertex resolution

MC hits

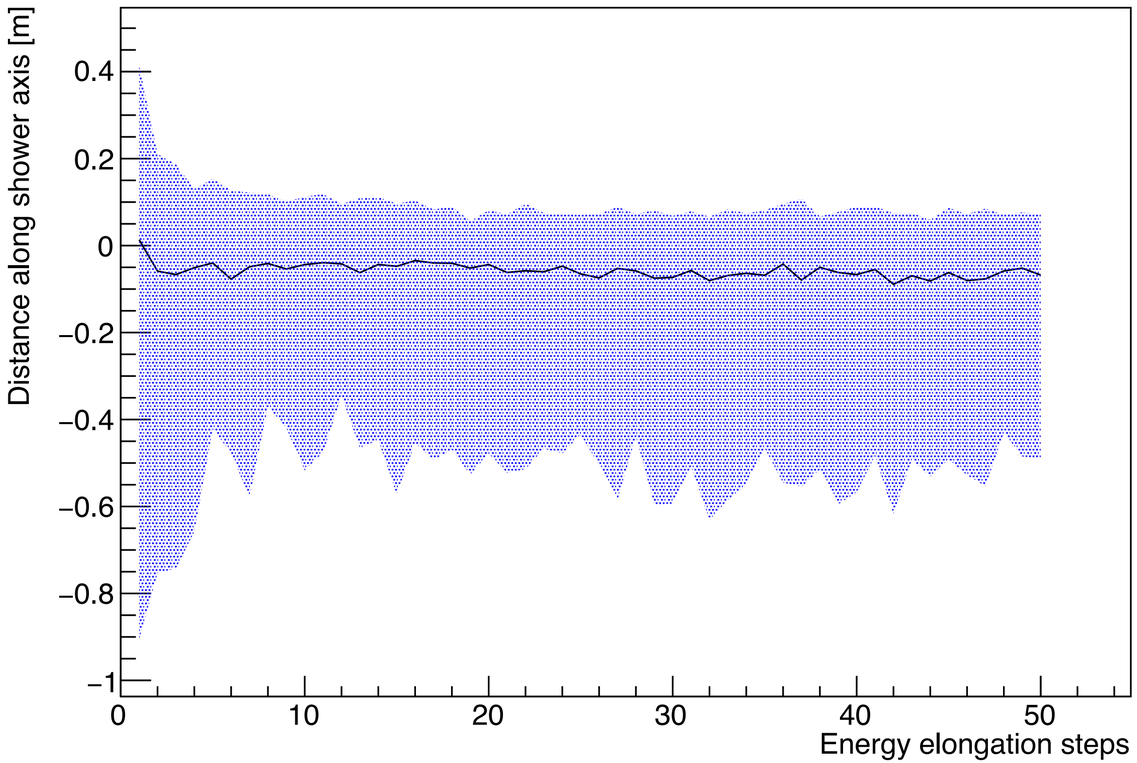
How does this resolution depend on the number of elongation steps?

- Same 102 events reconstructed with MC hits
- Energy elongation steps increased from 1 to 50

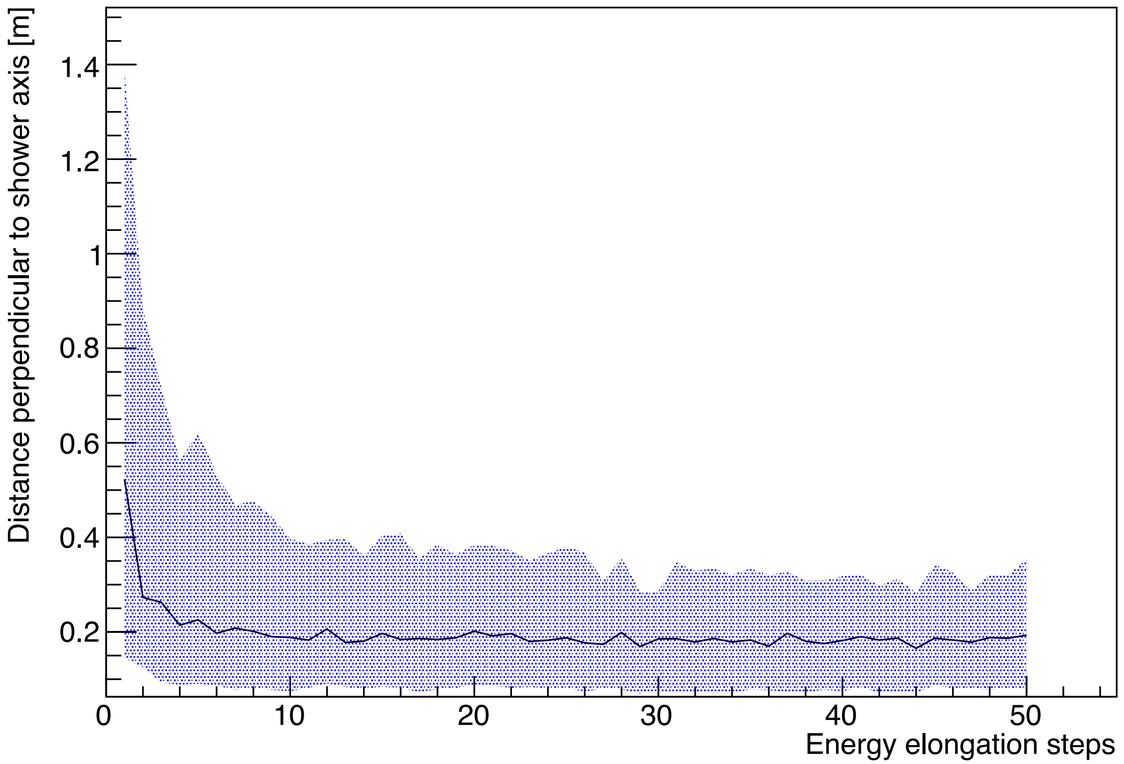
Vertex resolution

MC hits

Longitudinal



Perpendicular



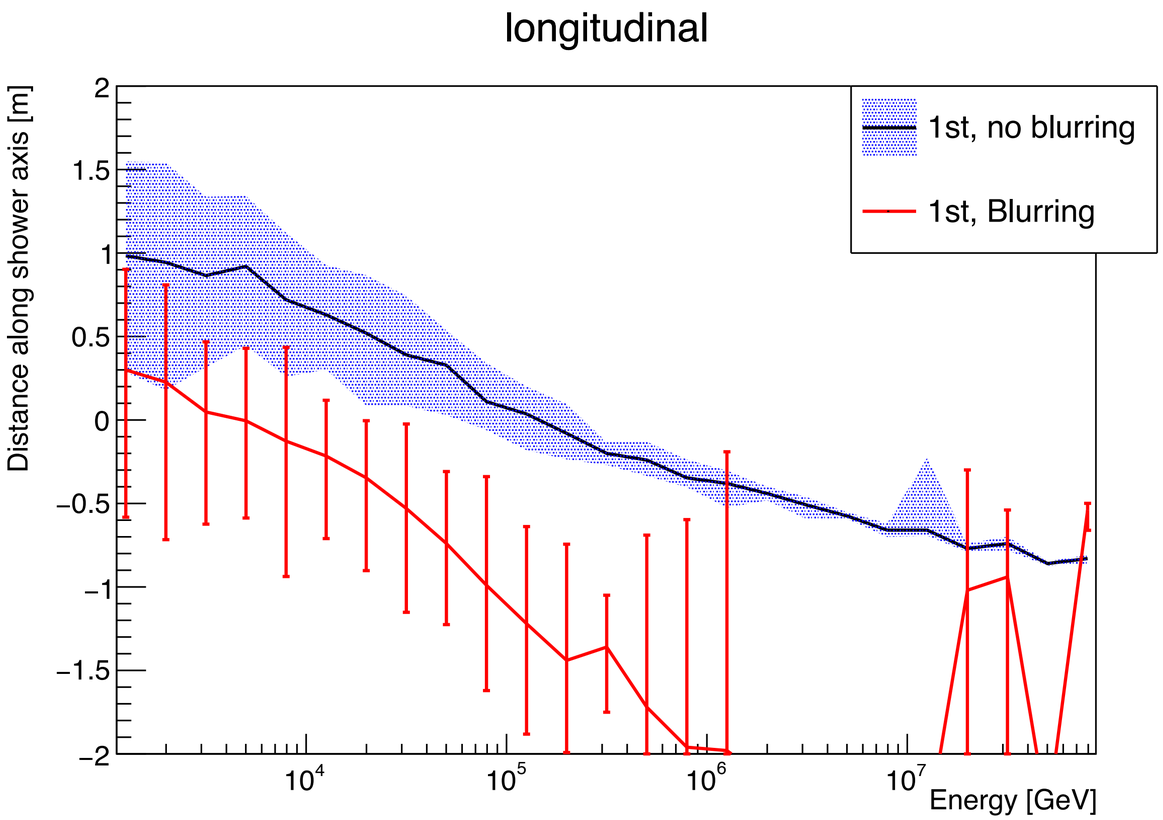
Vertex resolution

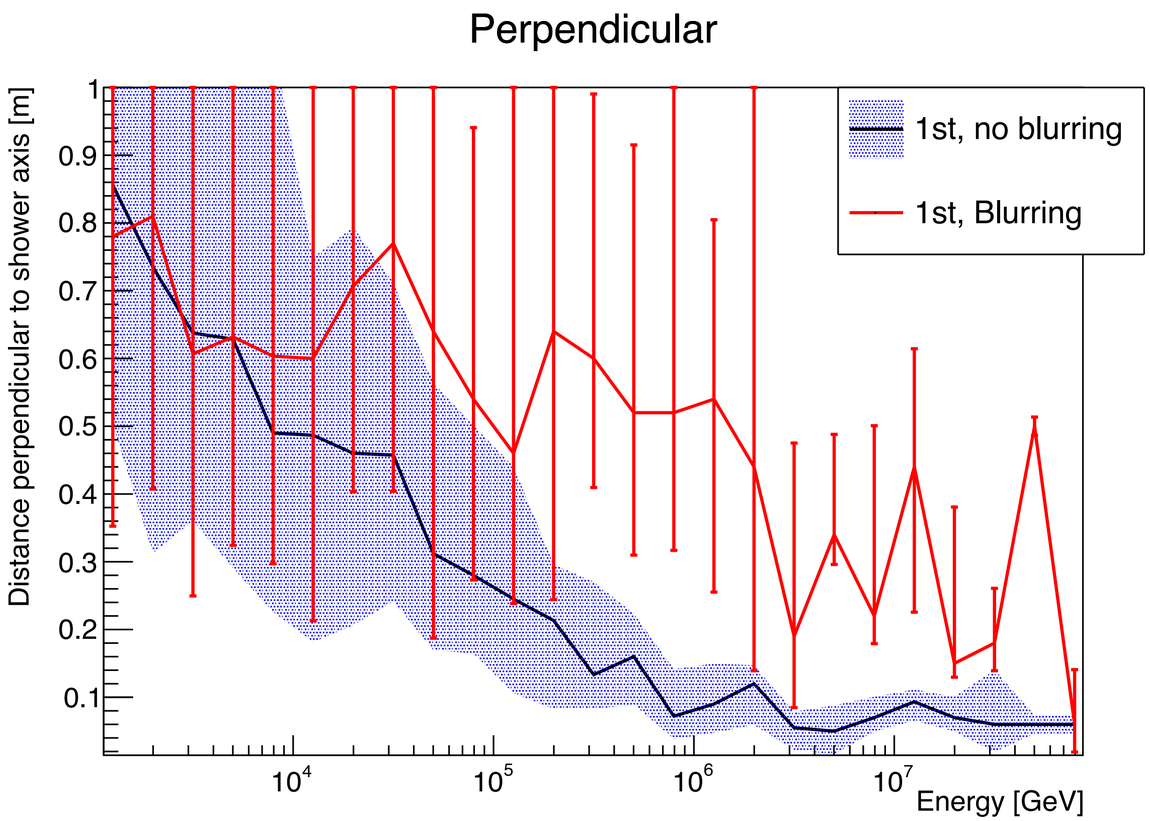
Hits

- 1 nueCC MCv5.1 file used (1060 contained events)
- 10 energy elongation steps
- With and without blurring of the PDF (TTS = 4.5 ns)
- Vertex fit starting at:
  - 1 meter from true in all (x,y,z) dimensions ($d_{start} = \sqrt{3}$ m)

Vertex resolution

$$d_{start} = \sqrt{3}$$





Blurring of the PDF while using first hits worsens the resolution

Conclusions

Using the 1st hits without blurring of the PDF yields the best resolution

Longitudinal (1st, no blur)	10 TeV	100 TeV	1 PeV	10 PeV
Median resolution [m] d = 0	0,658	-0,005	-0,348	-0,677
Median resolution [m] d = sqrt(3)	0,675	0,073	-0,363	-0,66

Perpendicular (1st, no blur)	10 TeV	100 TeV	1 PeV	10 PeV
Median resolution d = 0	0,433	0,276	0,078	0,075
Median resolution d = sqrt(3)	0,488	0,263	0,081	0,082