Vertex fit results

Vertex reconstruction

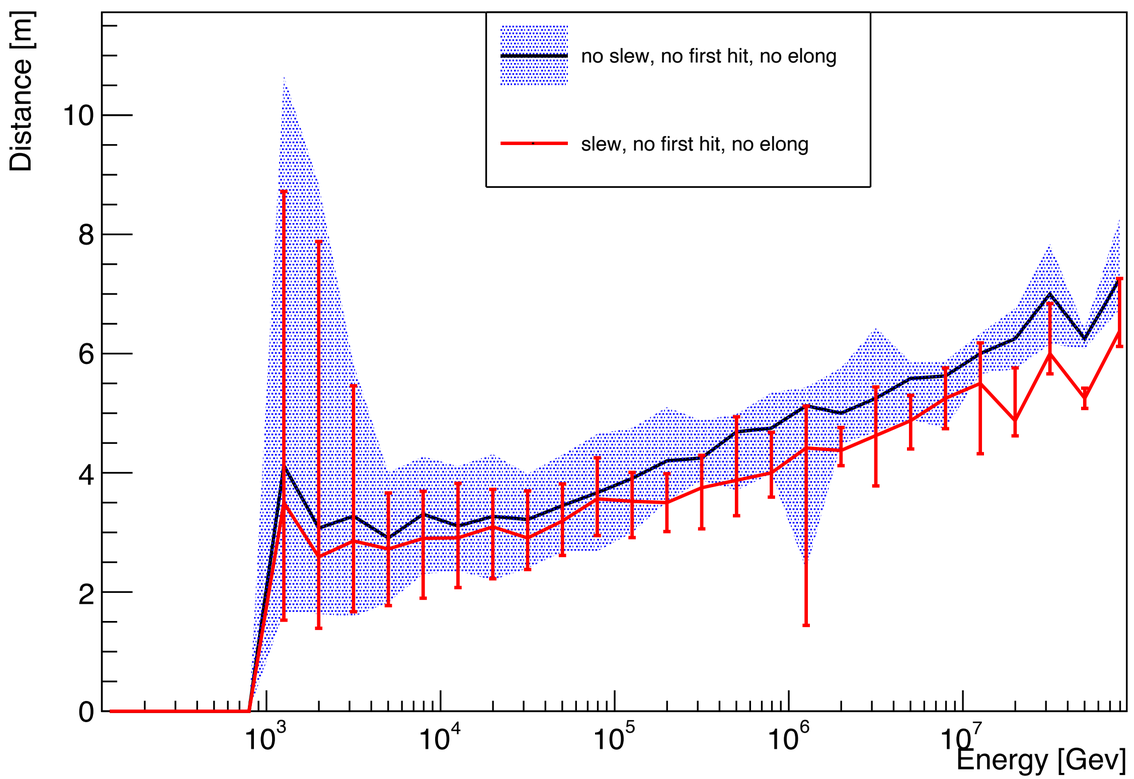
One MC NueCC file

8 options

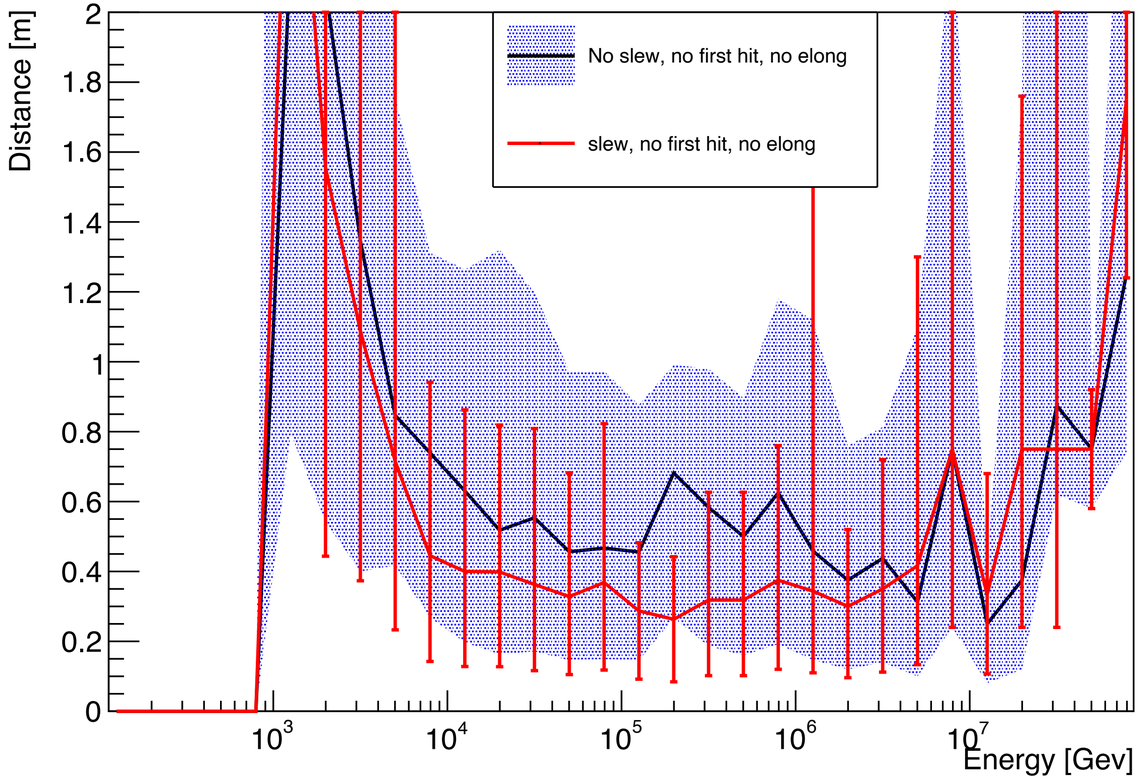
- Time slewing correction/No time slewing correction
- Using all hits and all hits PDF/Using first hits and first hit PDF
- Using shower elongation/Not using shower elongation

Resolution: time slewing correction

Distance along shower axis



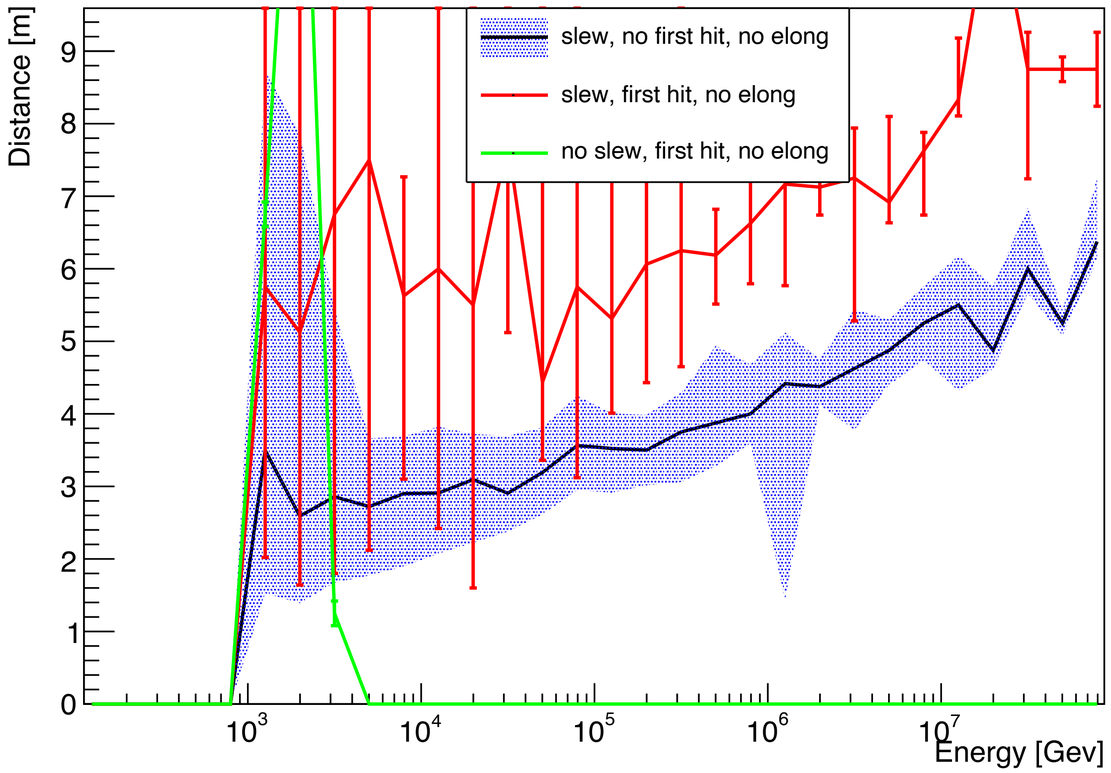
Distance perpendicular to shower axis



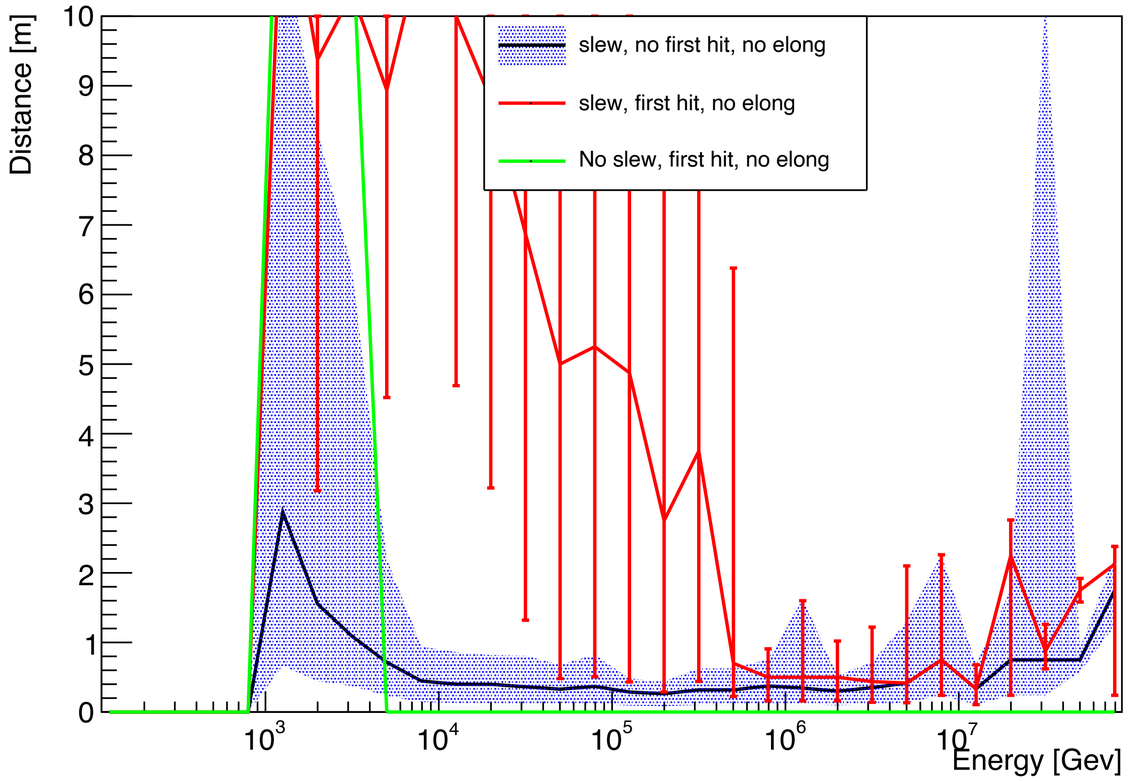
Time slewing correction improves the resolution

Resolution: using first hits

Distance along shower axis



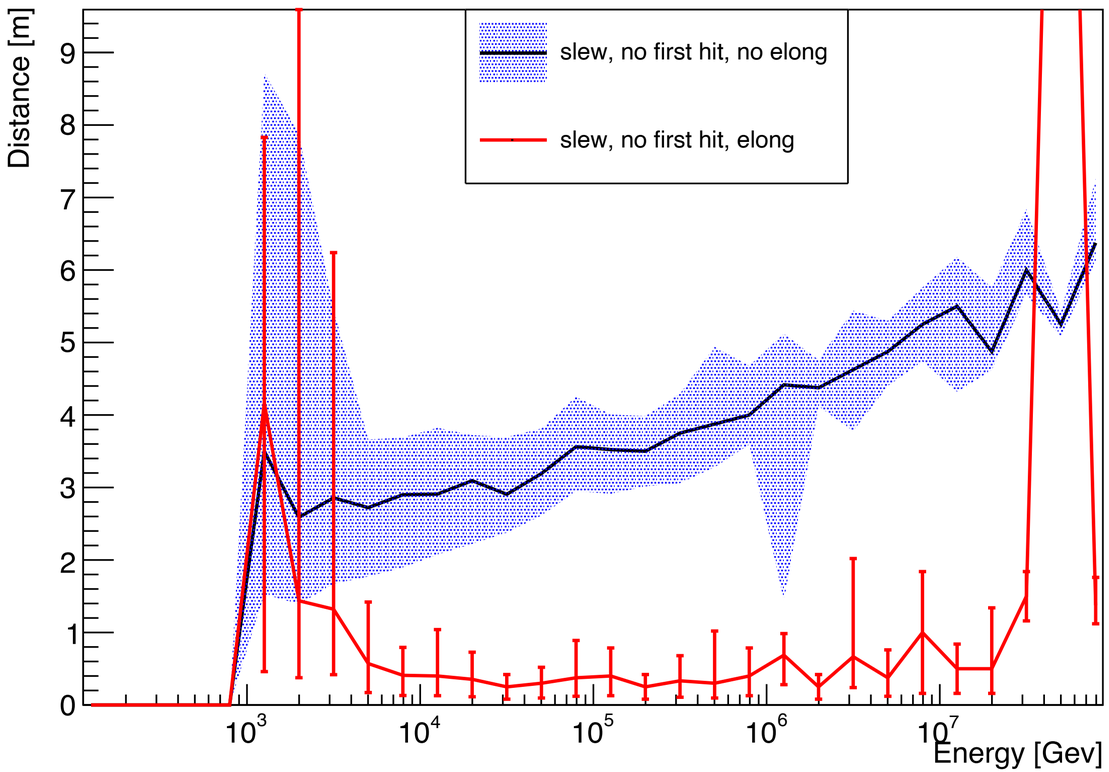
Distance perpendicular to shower axis



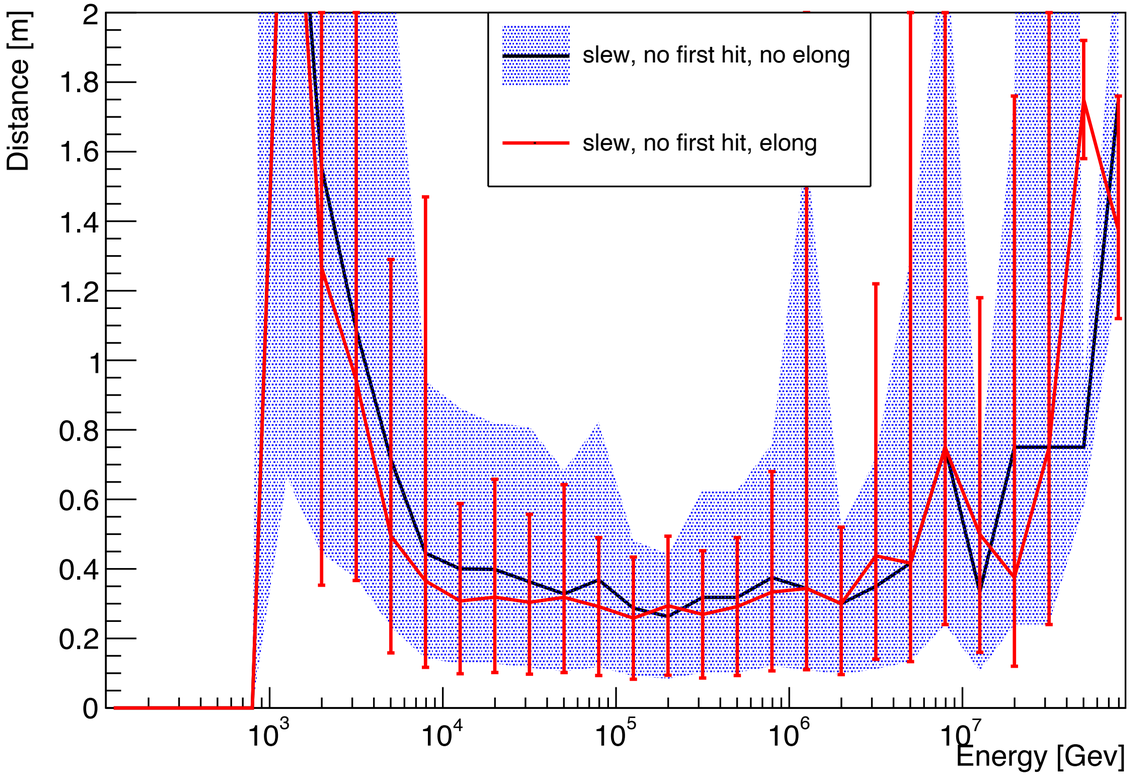
Using first hits gives problems; events not reconstructed?

Resolution: shower elongation

Distance along shower axis



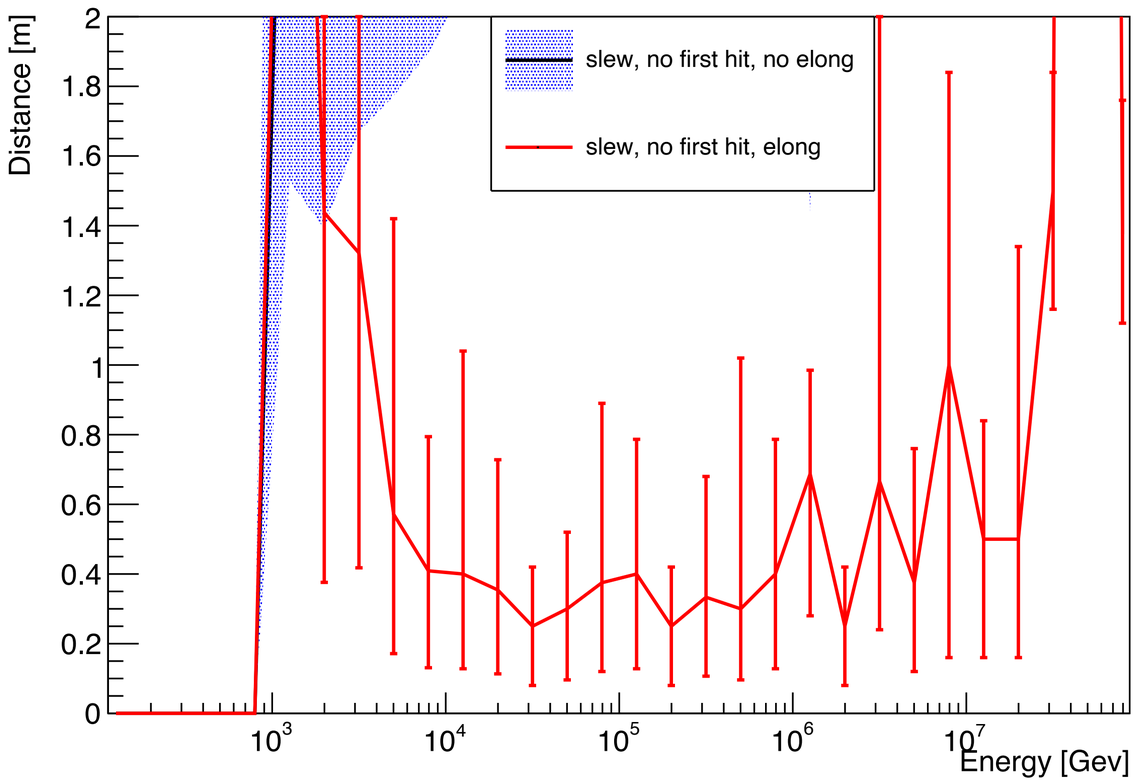
Distance perpendicular to shower axis



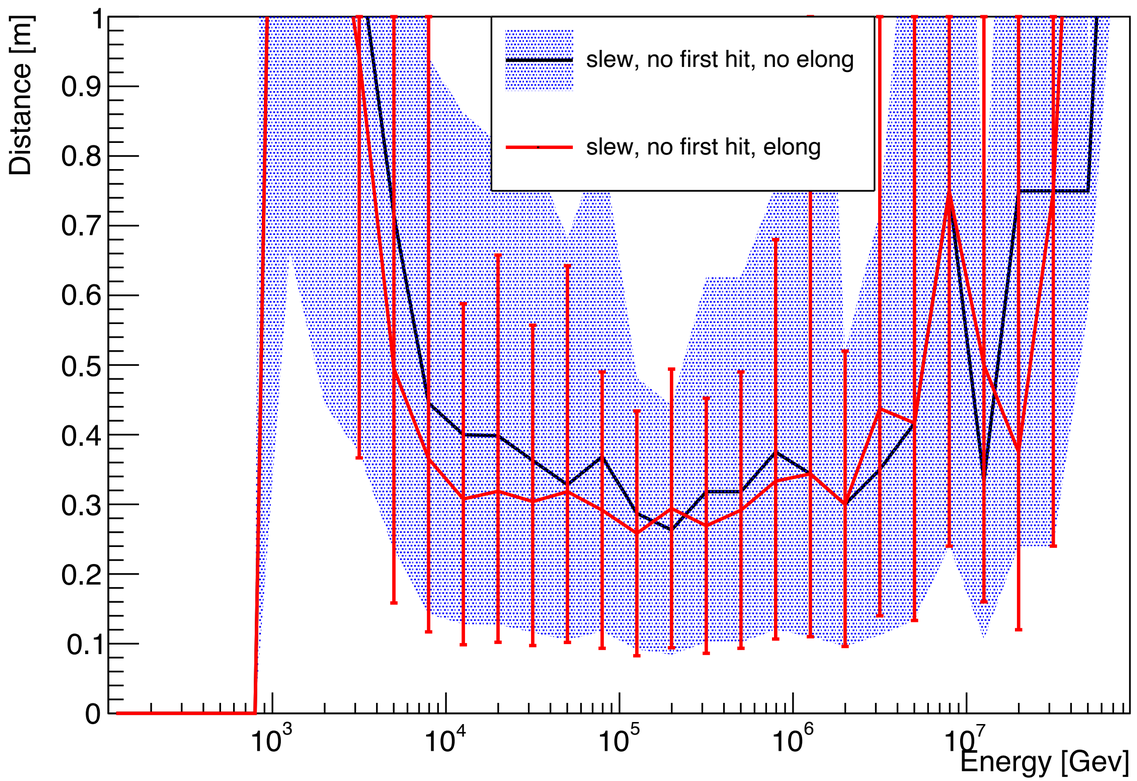
Using shower elongation (and time slewing correction) improves the resolution

Resolution: shower elongation

Distance along shower axis



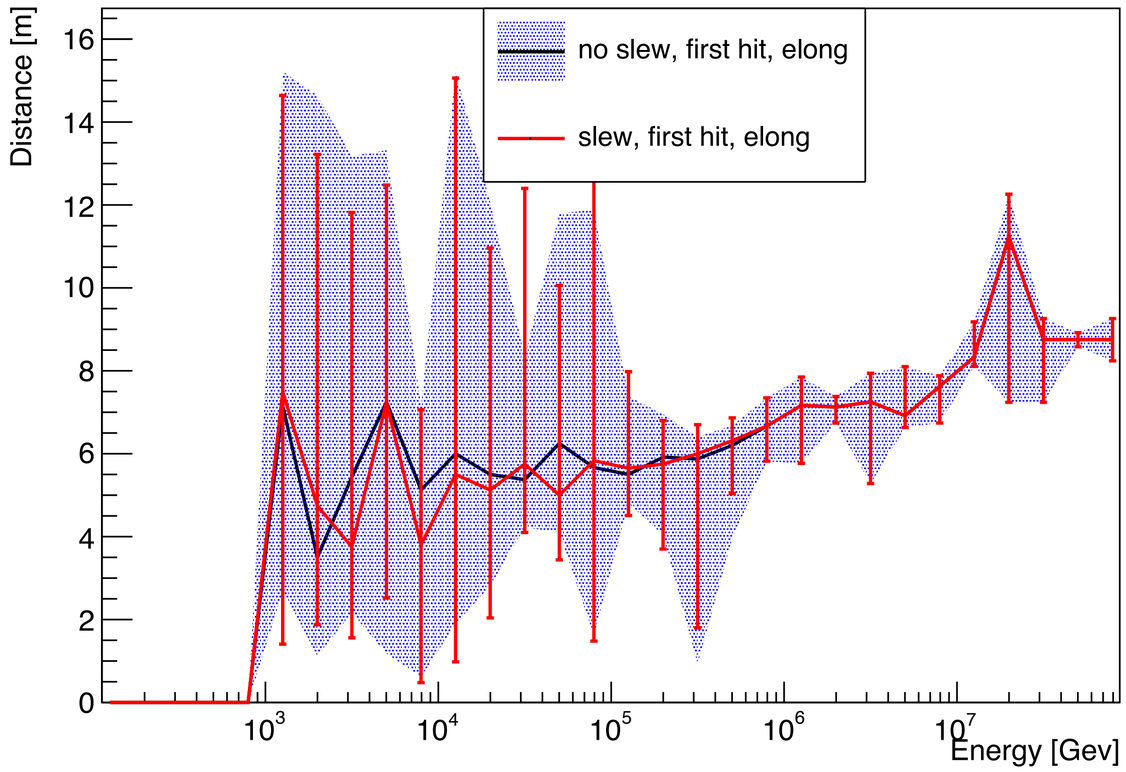
Distance perpendicular to shower axis



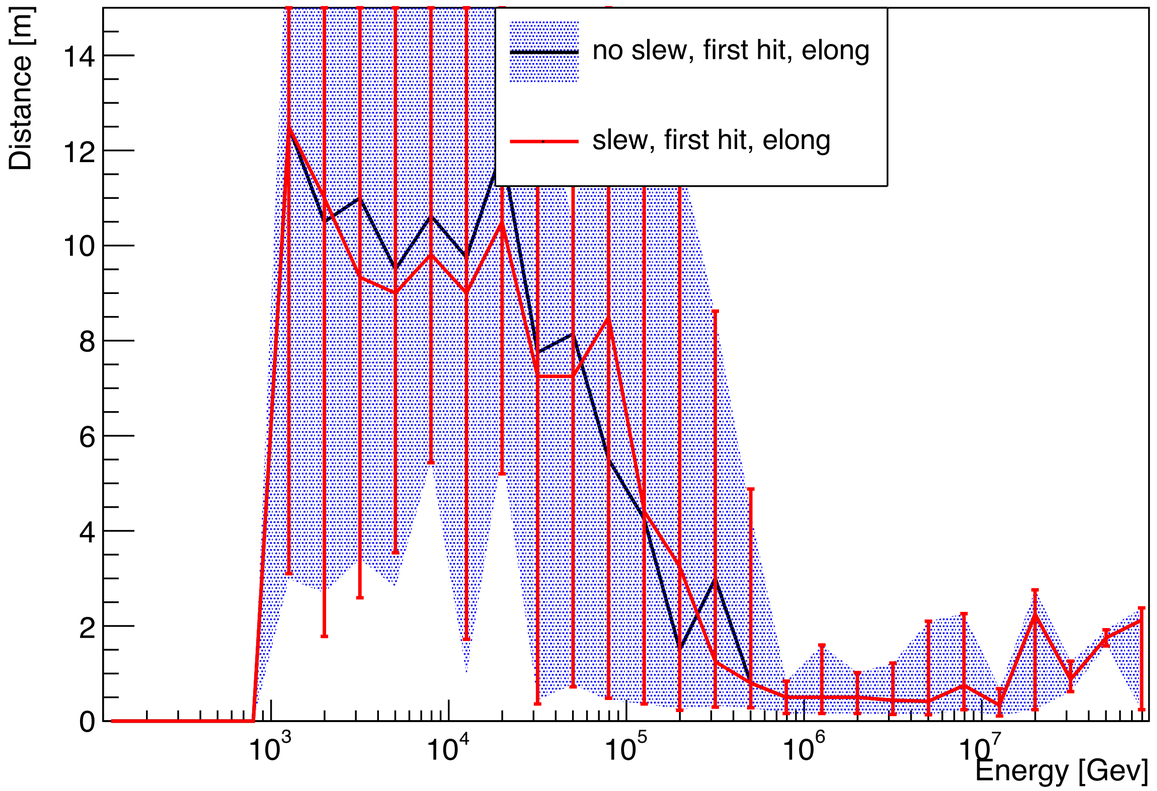
Using shower elongation (and time slewing correction) improves the resolution

Resolution: elongation and first hits

Distance along shower axis



Distance perpendicular to shower axis



Longitudinal distance does not improve, strange behaviour perpendicular distance:

Something wrong with calculation of 1st hit likelihood

Longitudinal vertex resolution

100 TeV

		Time slewing correction	No time slewing correction
Using all hits	No shower elongation	3.5 m	3.8 m
	Using shower elongation	0.39 m	0.58 m
Using 1st hits	No shower elongation	5.5 m	x
	Using shower elongation	5.7 m	5.6 m

Perpendicular vertex resolution

100 TeV

		Time slewing correction	No time slewing correction
Using all hits	No shower elongation	0.33 m	0.46 m
	Using shower elongation	0.28 m	0.39 m
Using 1st hits	No shower elongation	5.1 m	x
	Using shower elongation	6.5 m	4.9 m

Summary

Using shower elongation, time slewing correction and all hits the resolution is

- Longitudinal: 39 cm
- Perpendicular: 28 cm

Using first hits gives bad results; check if there are bugs