

Comparison of Current LCD Tracking Options

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Comparison of Tracker Parameters

We have three detectors concepts in various states of maturity:

- LARGE: Very refined by now
- PRECISE: Since FNAL, but never really discussed in polite company
- SILICON: 'S' redux; still crude (first presentation)

How uniform is agreement on what these detectors are?

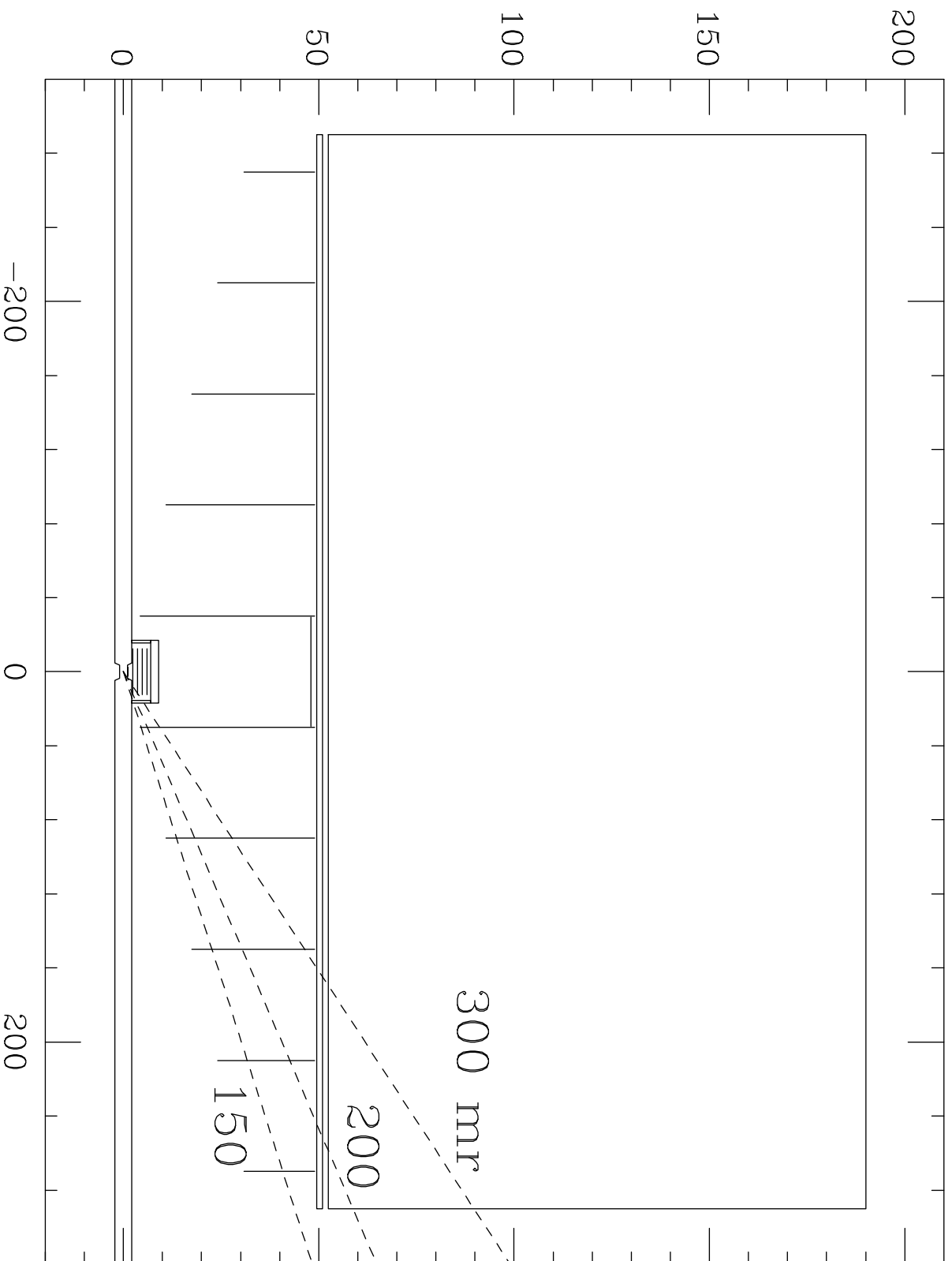
What is simulated?

Parameters...

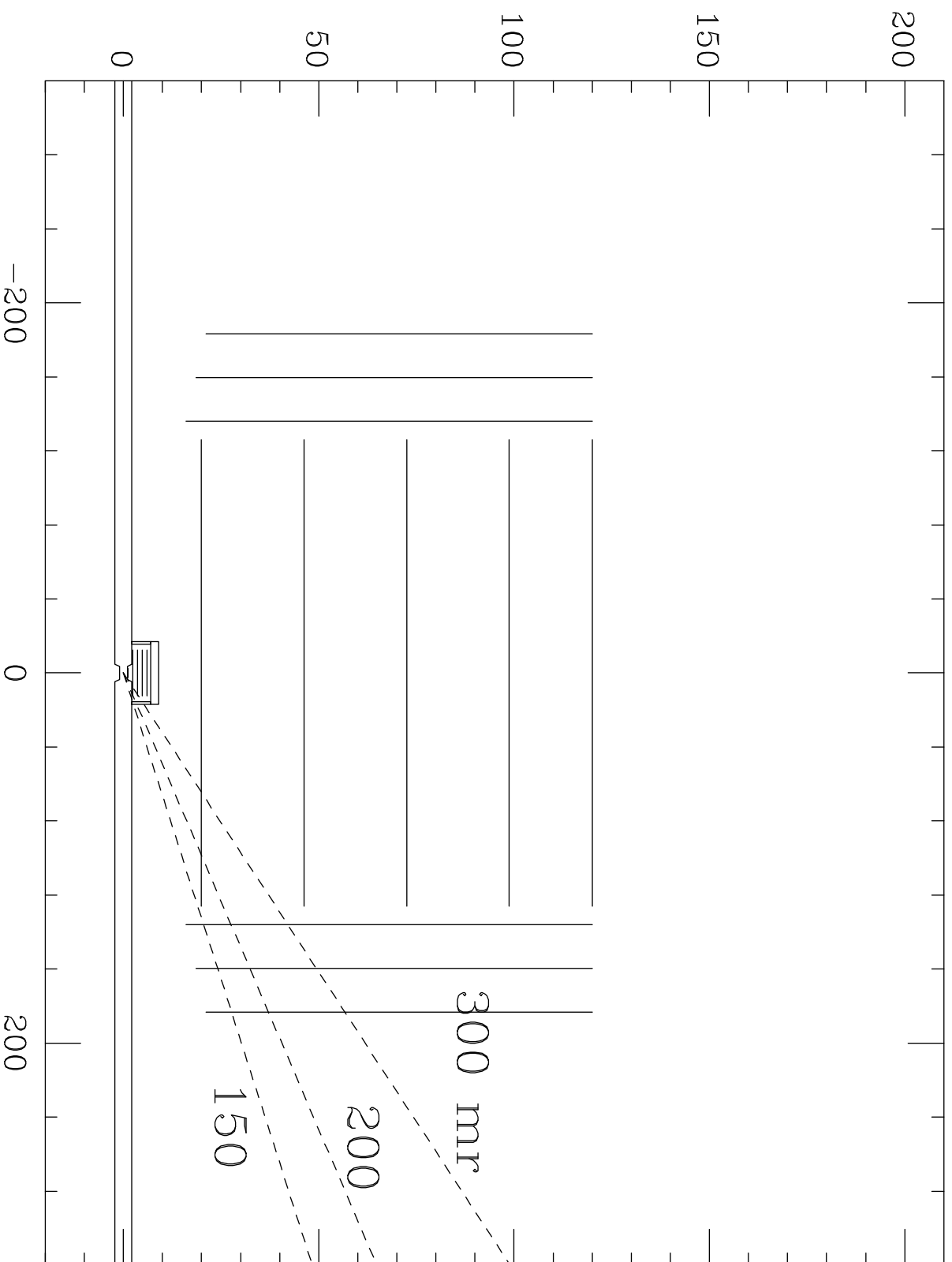
(Note: All disks go down to 110 mrad + 1cm clearance)

<u>Parameter</u>	<u>Large</u>	<u>Silicon</u>	<u>Precise</u>	<u>SLD</u>
VTX Inner Radius	1.2	1.2	1.2	2.8
VTX Outer Radius	6.0	6.0	10.0	4.8
No. VTX Layers	5	5	5	3
Max $\cos \theta$ 1 VTX	.982	.982	.975	.944
Max $\cos \theta$ All VTX	.902	.902	.832	.856
VTX Resolution (μm)	5	5	5	5.4
Intermediate Tracker?	Y	N	N	N
TRK Inner Radius	50	20	25	20
TRK Outer Radius	190	125	150	100
No. TRK Layers	144	5	122	80
$r - \phi$ Resolution (μm)	140	7	140	100
No. Disks	5	3	5	
Max Disk z	270	183	190	
Stereo Angle (rad)	.020	.020	.020	
Disk Resolution (μm)	7	7	7	
B (Tesla)	3	5	3	0.6

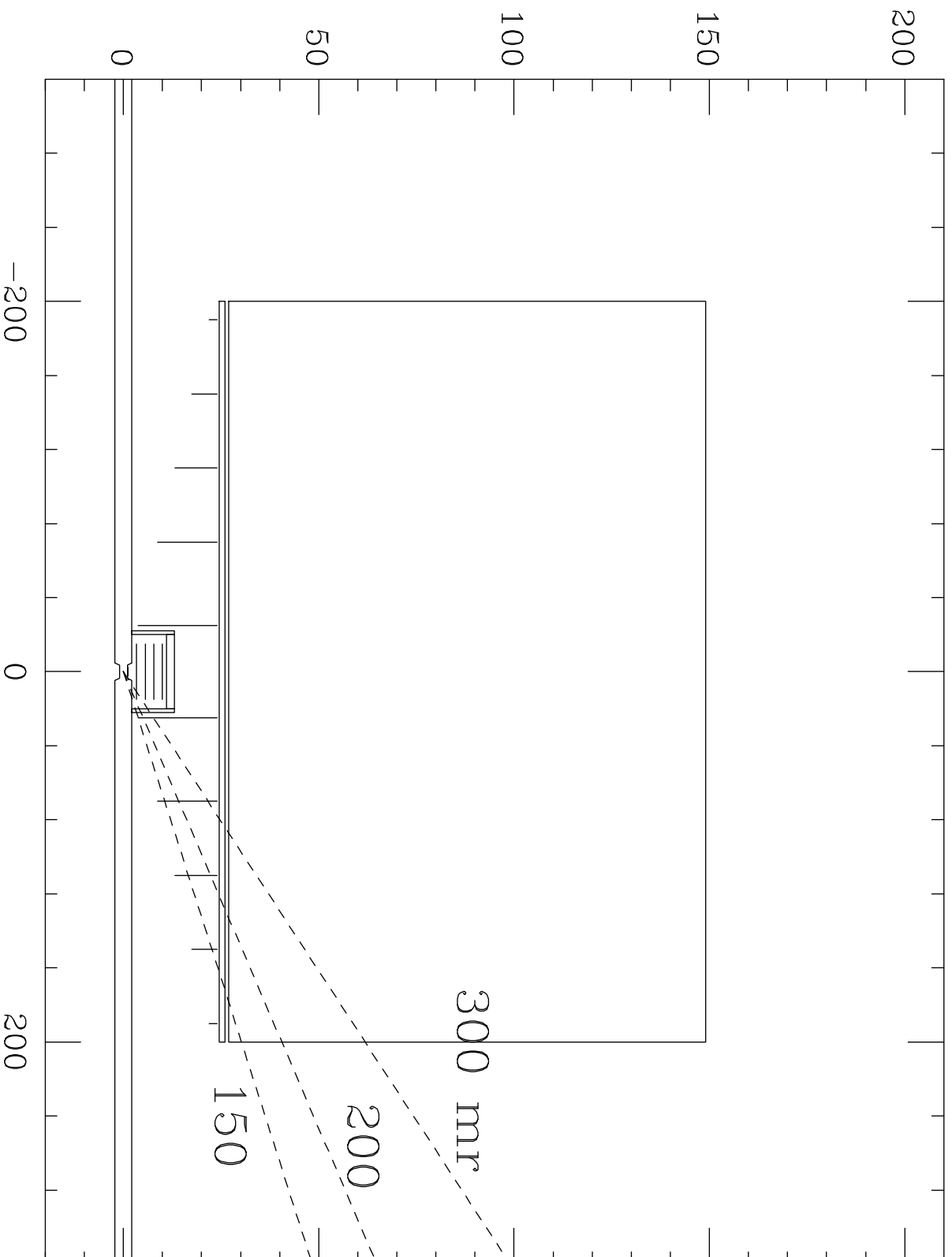
LARGE DETECTOR



SILICON DETECTOR



PRECISE DETECTOR



Resolution Comparisons, Conclusions

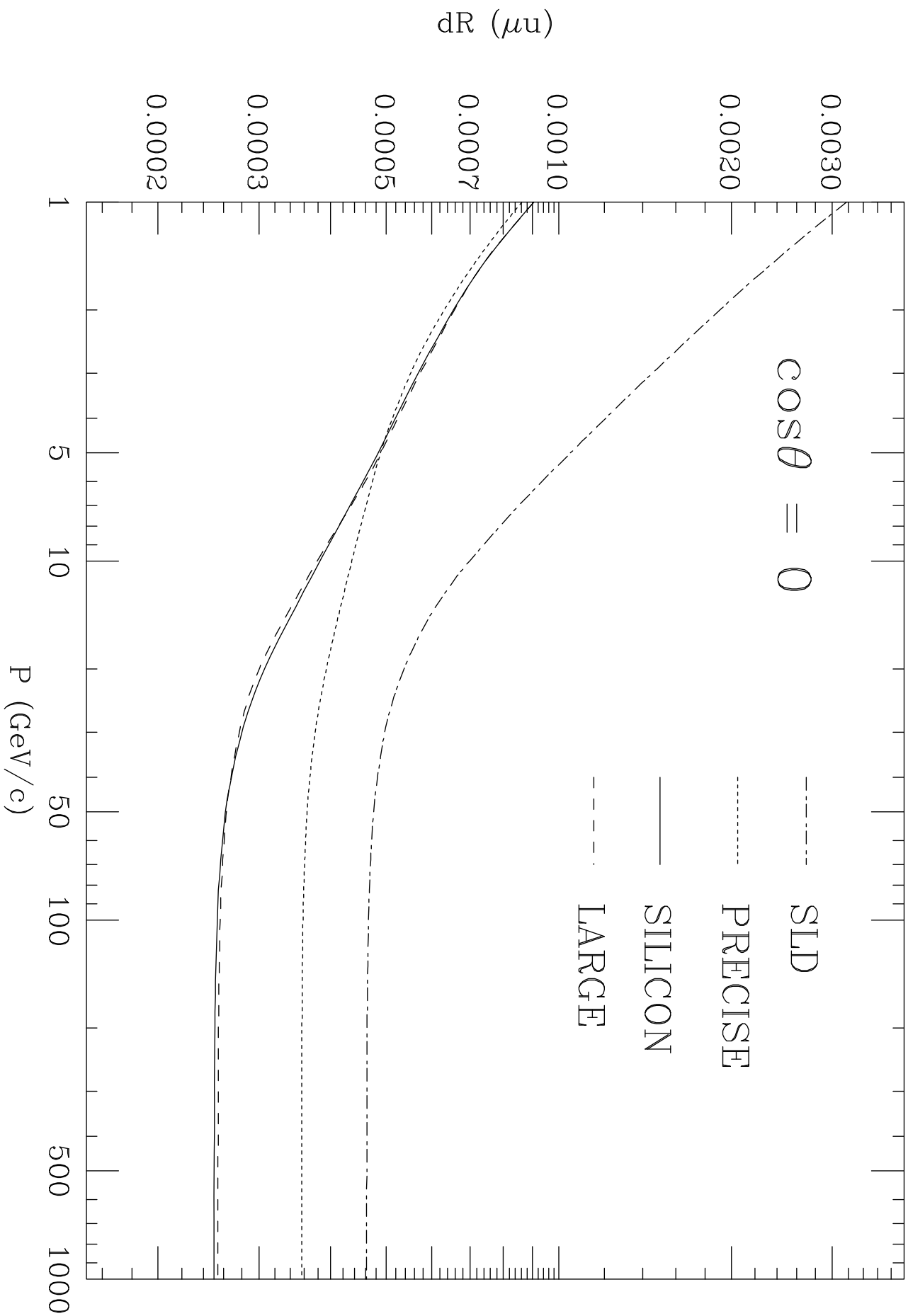
All but dR are Beam Constrained! (this seems fair given motivations for p , θ resolutions)

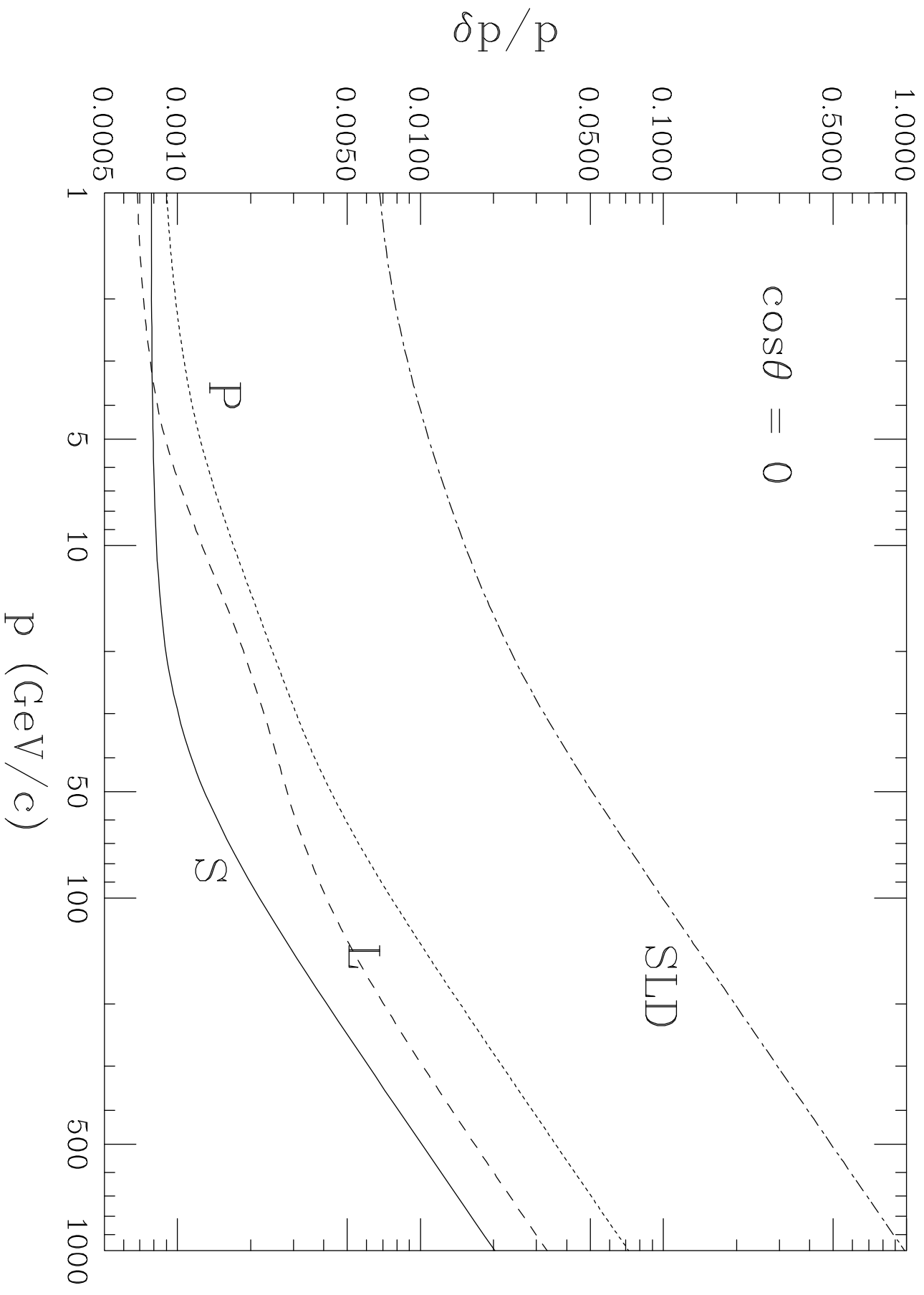
S detector p resolution quite good over all angles

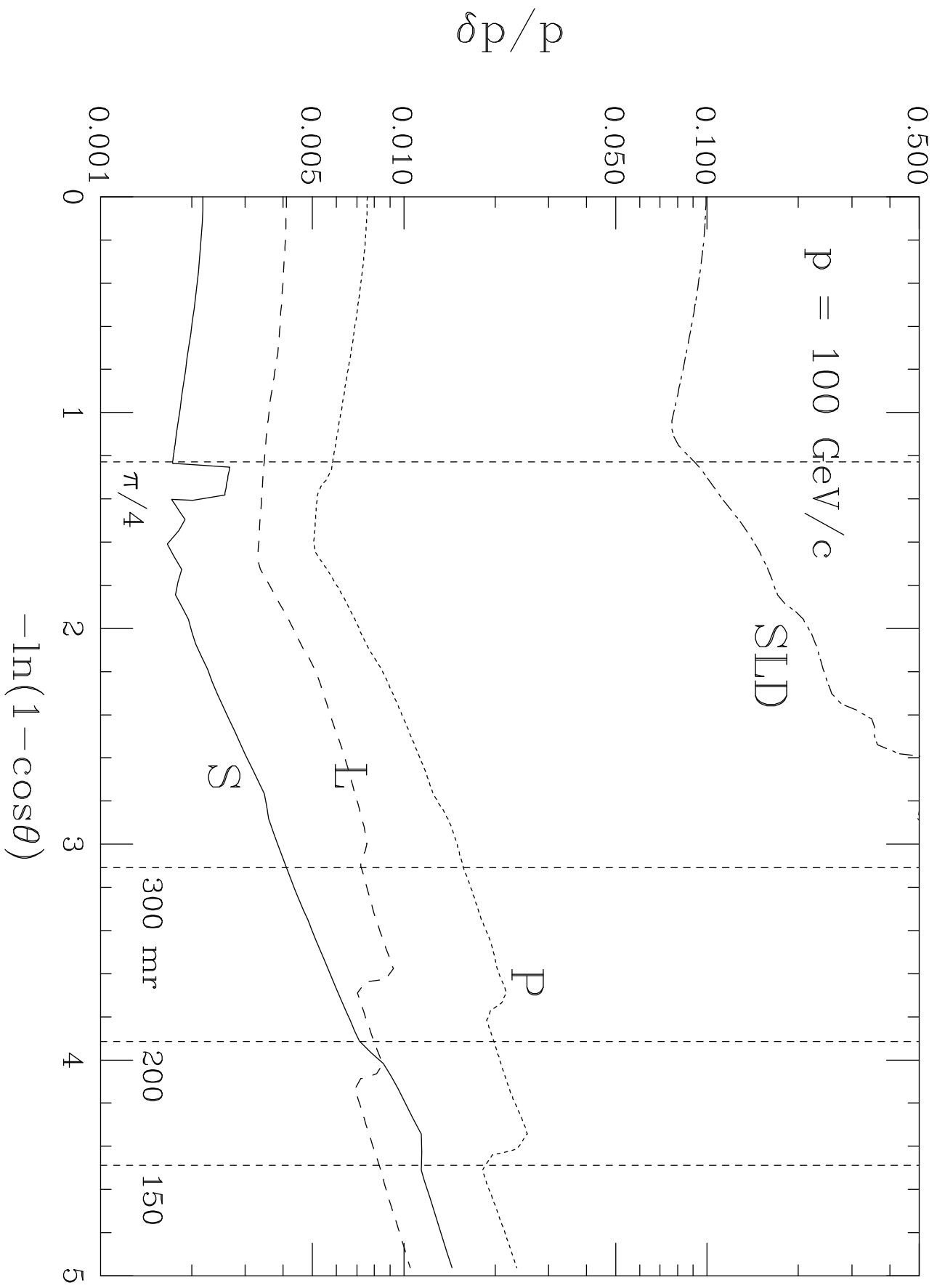
Low angle tracking somewhat more pressed for new S design (pattern recognition, θ resolution)

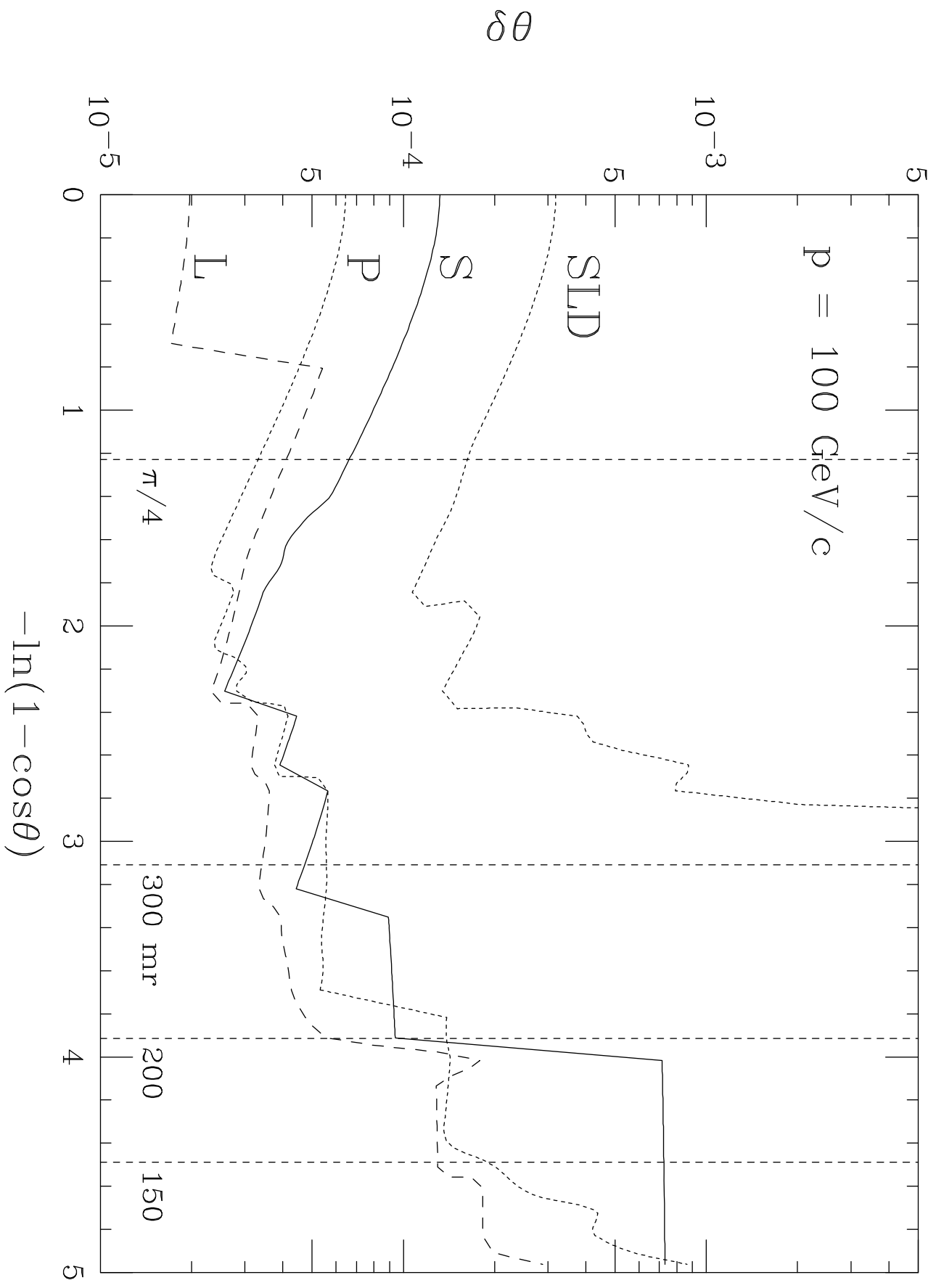
S detector in real trouble at low angle w/out beam constraint (see final plot with beam constraint removed)

S does not seem so robust in forward direction. I think we should refine a bit.









WITHOUT BEAM CONSTRAINT

