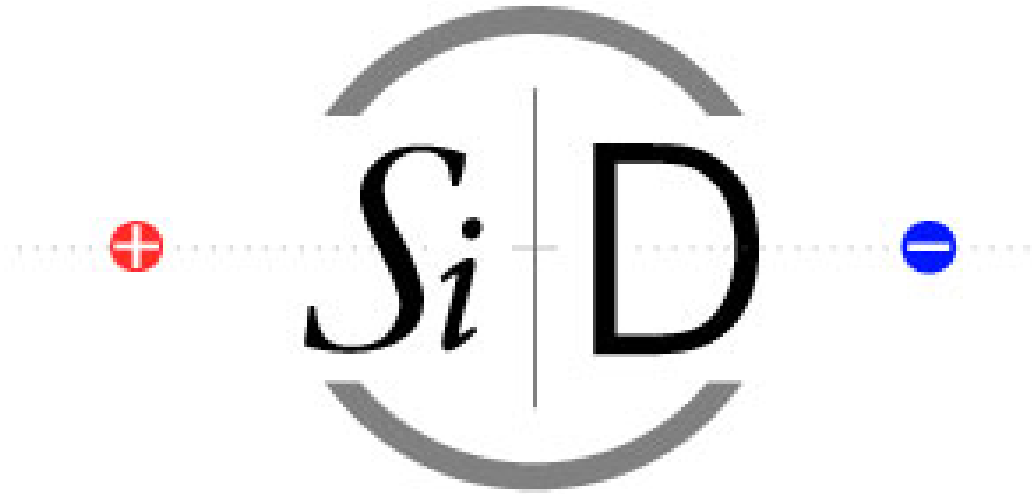


# SiD's Global Parameters



July 14, 2008 SiD Advis

John Jaros

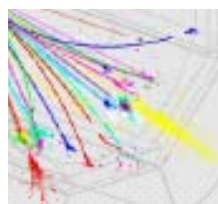
# New since Warsaw

- Marty's Warsaw talk summarized status mid June.
- Marcel has studied  $z$  dependence at 91, 200, 500 GeV.  
Effects seen at 200 are also seen at other energies, and are expected naively.  
***They indicate SiD should be longer than nominal 1.7 m (to endcap ecal front face).***
- Marcel has studied  $n$  and  $\lambda$  dependence around the SiD nominal global params (5T, 1.25m) at 100 GeV jet energy.

Very little improvement beyond 4-4.5  $\lambda$

Increasing  $n$  compensates for decreasing  $\lambda$ . It turns out that these changes are roughly flat in cost, and the total thickness of the hcal is about 1.2m for various combinations.

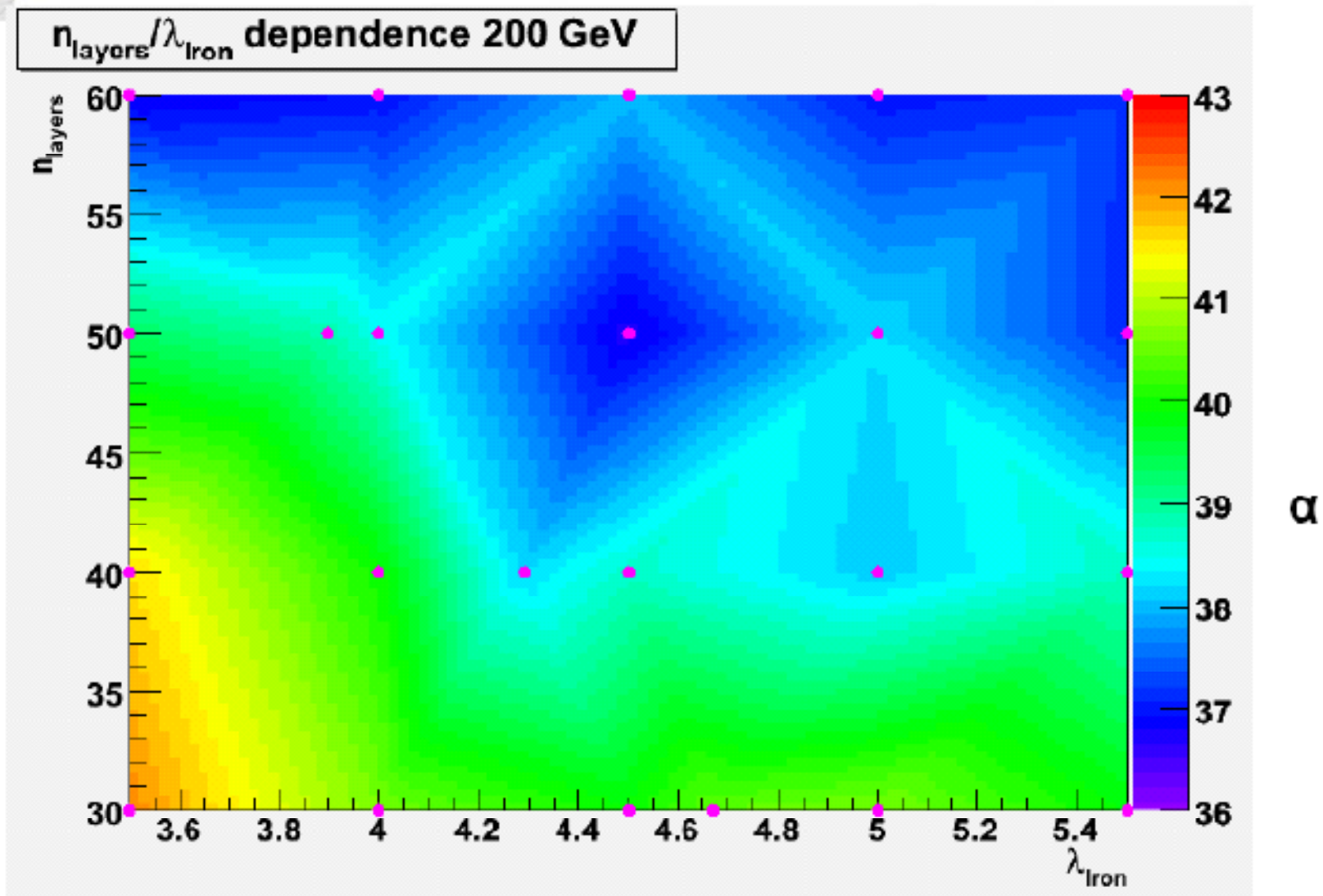
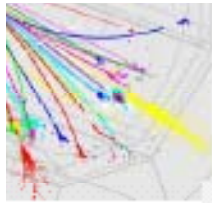
***Conclude that 4.5  $\lambda$  and 40 layers is reasonable.***

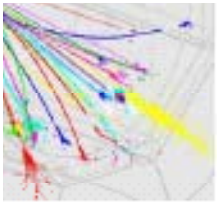


# The results

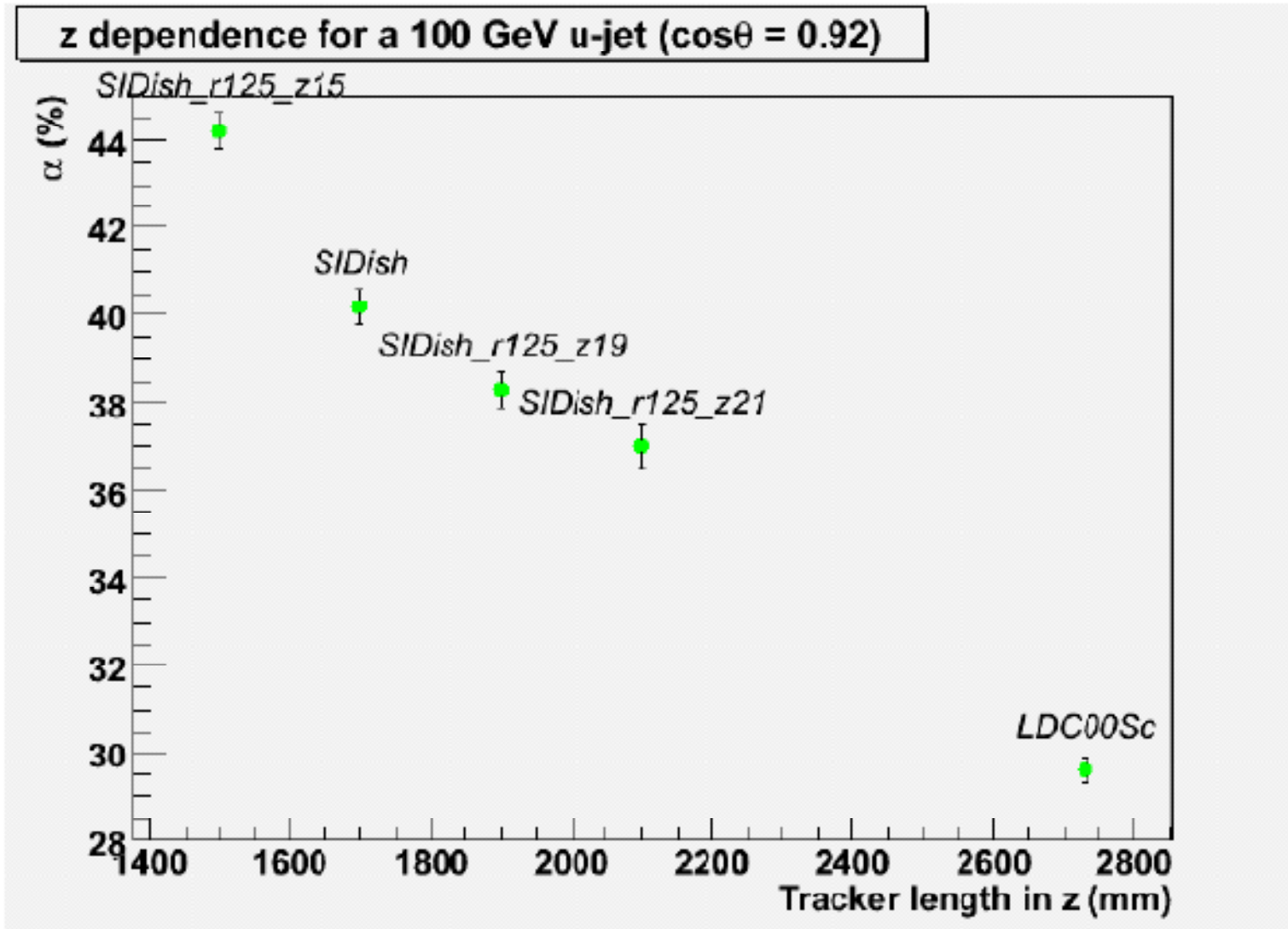
Detector Tag	Layers	uds (91 GeV)		uds (200 GeV)	
		$\alpha$ %	Error	$\alpha$ %	Error
SIDish_v2_hcal30	30	30.5	0.4	40.5	0.7
SIDish_v2_hcal40	40	28.5	0.5	38.2	0.7
SIDish_v2_hcal50	50	28.6	0.4	38.8	0.8
SIDish_v2_hcal30_l45	30	29.6	0.4	39.9	0.7
SIDish_v2_hcal40_l45	40	29.3	0.4	38.7	0.7
SIDish_v2_hcal50_l45	50	28.2	0.7	36.7	0.7
SIDish_v2_hcal60_l45	60	27.7	0.4	38.0	0.8
SIDish_v2_hcal30_l50	30	30.1	0.4	40.6	0.8
SIDish_v2_hcal40_l50	40	29.1	0.4	38.1	0.7
SIDish_v2_hcal50_l50	50	28.7	0.4	38.2	0.7
SIDish_v2_hcal60_l50	60	28.5	0.4	37.0	0.7
SIDish_v2_hcal30_l55	30	30.4	0.4	39.9	0.7
SIDish_v2_hcal40_l55	40	29.0	0.4	38.7	0.7
SIDish_v2_hcal50_l55	50	28.7	0.4	37.1	0.7
SIDish_v2_hcal60_l55	60	28.7	0.4	37.1	0.7
SIDish_v2_hcal30_l40	30	29.1	0.4	40.6	0.7
SIDish_v2_hcal40_l40	40	29.5	0.4	39.9	0.8
SIDish_v2_hcal50_l40	50	28.4	0.4	38.5	0.8
SIDish_v2_hcal60_l40	60	28.4	0.4	36.9	0.8
SIDish_v2_hcal30_l35	30	29.9	0.4	42.1	0.8
SIDish_v2_hcal40_l35	40	30.2	0.4	41.6	0.8
SIDish_v2_hcal50_l35	50	29.1	0.4	39.3	0.8
SIDish_v2_hcal60_l35	60	28.2	0.4	36.8	0.8

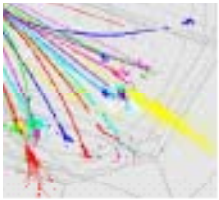
# 200 GeV





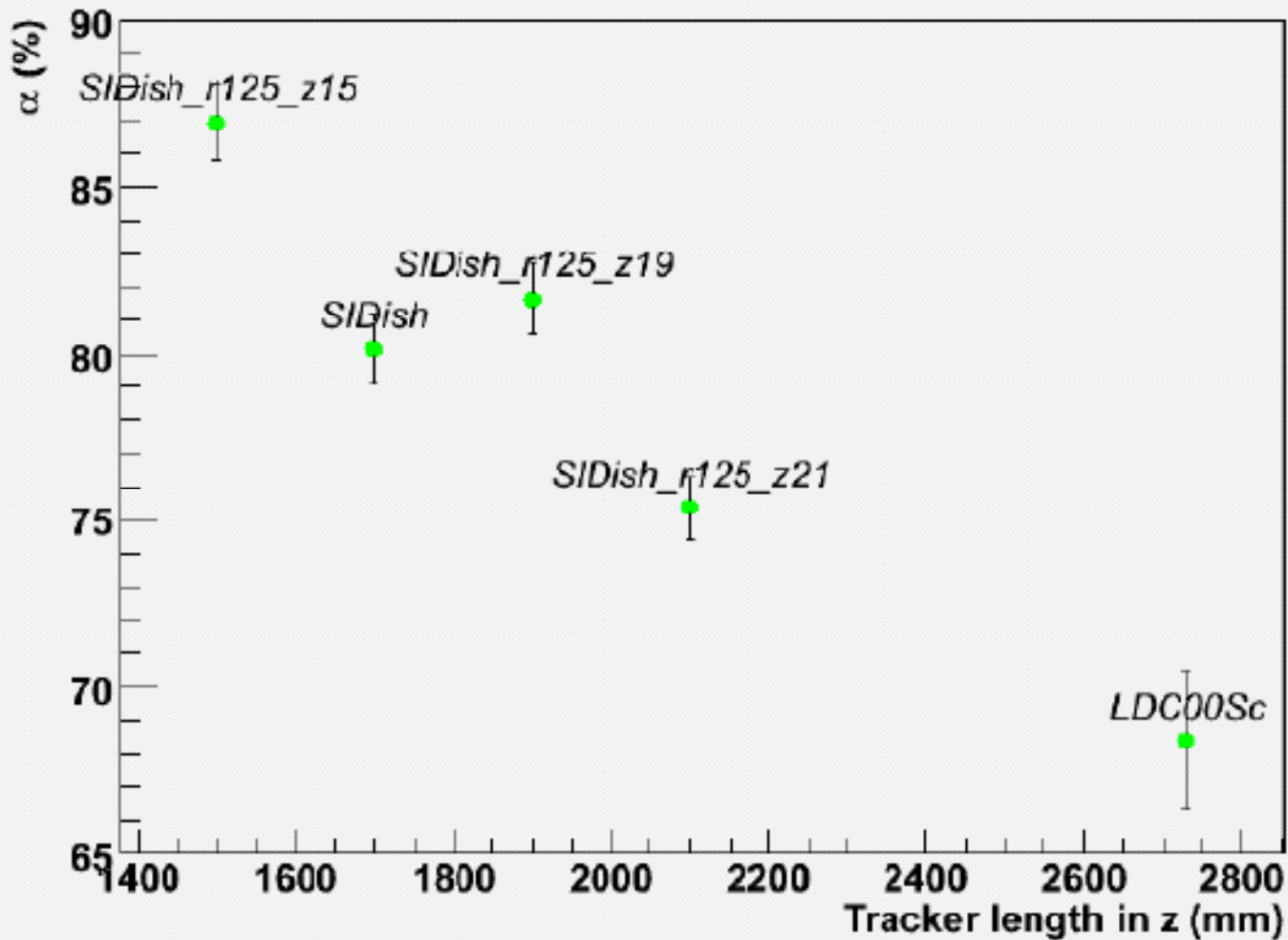
# z dependence 100 GeV





# z dependence 250 GeV

z dependence for a 250 GeV u-jet ( $\cos\theta = 0.92$ )



# SiD and SiDish and Cost a point of view

- We've estimated that SiD's jet energy resolution is probably 0-20 % worse than that of SiDish because of RPCs vs Scint and si tracking vs TPC tracking.
- Marty's talk at Warsaw showed that SiD's performance was on the wrong side of the cost vs performance "knee"
- My point of view: Better to be a little too performant and too expensive at this point, especially given uncertainties in performance.