

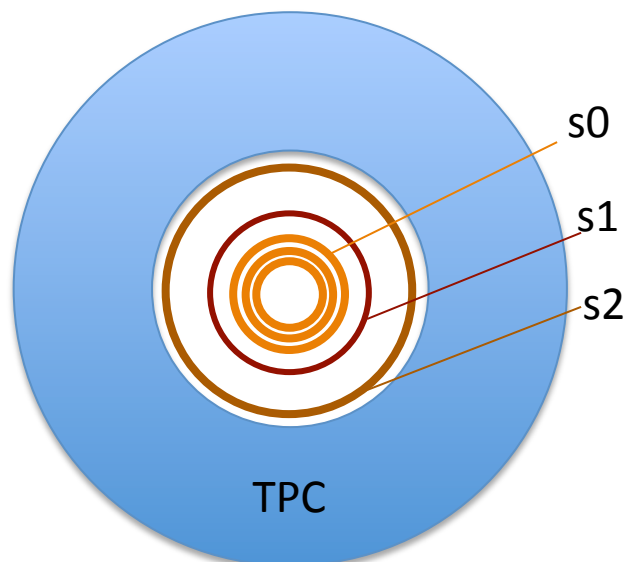
Reconsideration of Silicon Tracker

sPHENIX Silicon Tracker Group

Compact Si-Tracker Option

- Max Radius 64cm -> 30cm
- Substantial cost down to meet DOE budget for tracker of \$5M.
- Still sufficient for jet structure and b-tagging measurements.
- Upsilon Momentum resolution will be degraded. To be evaluated by MC. (Gaku)
- May be applied to another category \$2M limit in JSPS, instead of \$5M.

Cost Estimate for Downsized Si-Tracker



	Original	Downsize	FVTX
S0 radius [cm]	7.5,8.5	8,10,12	
S1 radius [cm]	31,34	15	
S2 radius [cm]	64	30	
Total # of chip	30000	8580	8448
Total Cost	\$6.5M	\$3M*	\$4.7M

*including 40% contingency

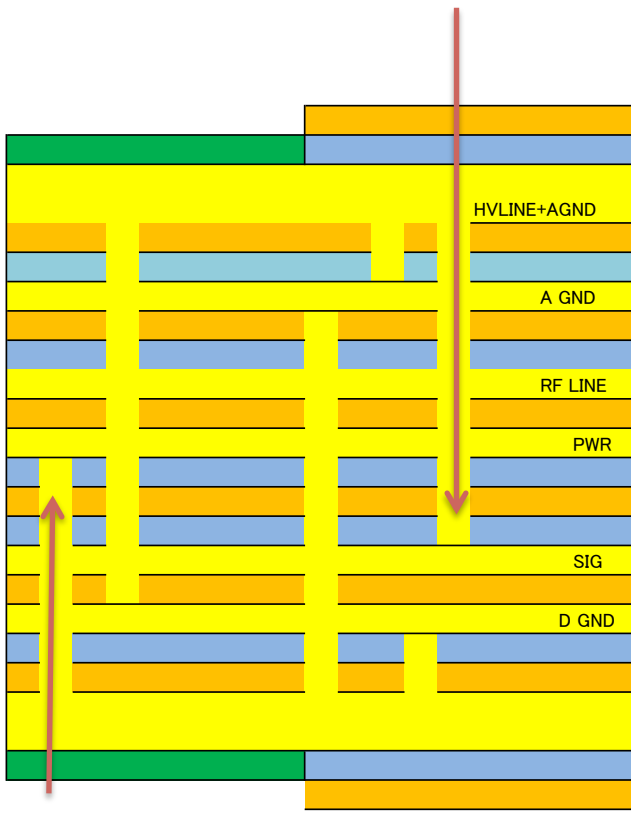
Station	Layer	radius (cm)	pitch (μm)	sensor length (cm)	depth (μm)	total thickness $X_0\%$
Pixel	1	2.4	50	0.425	200	1.3
Pixel	2	4.4	50	0.425	200	1.3
S0a	3	7.5	58	9.6	240	1.0
S0b	4	8.5	58	9.6	240	1.0
S1a	5	31.0	58	9.6	240	0.6
S1b	6	34.0	58	9.6	240	0.6
S2	7	64.0	60	9.6	320	1.0

Station	R [cm]	X_0 [%]
(p0)	2.4	1.3
s0a	8	1.0
s0b	10	1.0
s0c	12	1.0
s1	15	0.6
s2	30	1.0

Giving up 1 staggered layer s1b will reduce the material (better resolution) at the cost of redundancy (efficiency).

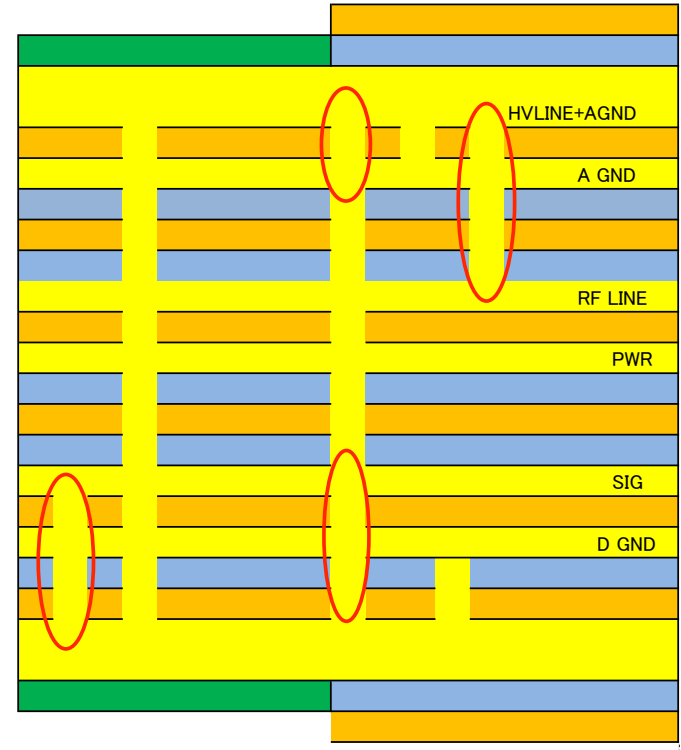
Difficulty in S1 HDI Thru Holes

Difficulty in laser power control to make thru hole at exact depth.



Total Thickness = 511µm

New design to have only either shallow or complete thru holes



Total Thickness = 496µm

s1 HDI New Schedule

- Originally, the HDI is to be delivered by the end of April.
- Design work is now underway and to be completed by 2nd week of May.
- Delivery day will be delayed to beginning of July.

JFY2016 Schedule

2016 Month	4	5	6	7	8	9	10	11	12	1	2	3	4		Design
s1 Layer															Production
Silicon Sensor-I	Production														Test
HDI prototype-I	Production	Production	Production												
Silicon Module-I				Production	Test	Test									
Silicon Sensor-II							Design	Production	Production						
HDI prototype-II							Design	Production	Production						
Silicon Module-II										Production	Test				
HDI prototype-III												Design	Production		
Silicon Module-III												Design	Production		
s0 Layer															
Silicon Sensor-I			Design	Production	Production										
HDI prototype-I			Design	Design	Design	Production	Production								
Silicon Module-I									Production	Production	Test	Test			