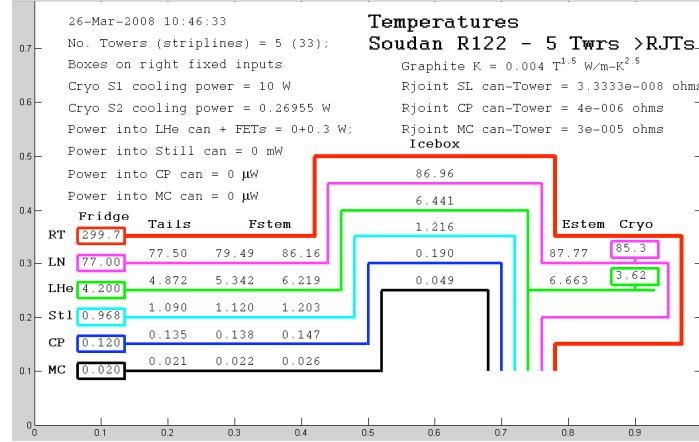


	Estem Shield Dimensions		Estem IVC Dimensions		Heat flows at fridge side access flange				
	Stem OD in.	Wall Thk in.	Stem OD in.	Wall Thk in.	Shield W	IVC W	ST mW	CP μW	MC μW
Soudan R122 with estem 2 stage cryo	2.625	0.125	2.125	0.0625	11.32	0.56	4.44	38.07	0.49
SCDMS with estem 2 stage cryo	4	0.25	3	0.25	3.56	0.33	2.87	46.84	0.80
SCDMS with estem 1 stage cryo	4	0.25	3	0.25	3.57	0.53	4.74	58.74	0.98
SCDMS with no estem cryo	4	0.25	3	0.25	15.29	0.66	5.64	64.73	1.07
SCDMS with estem 2 stage cryo, bigger estem	6.50	0.50	4.25	0.88	1.87	0.17	1.94	41.16	0.72

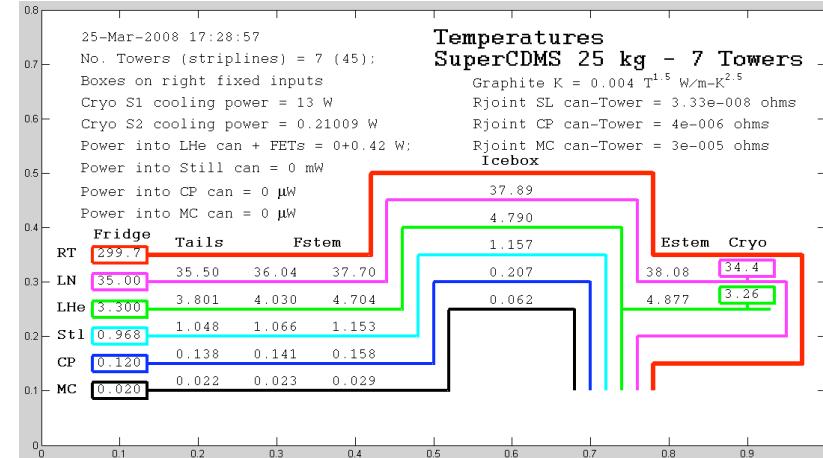
	Estem Cryo heat flows		Stripline heat flows		Can Temperature Comparison				
	Shield Cryo W	IVC Cryo W	RT -> Shield W	Shield -> IVC W	Shield K	IVC K	ST K	CP K	MC K
Soudan R122 with estem 2 stage cryo	10	0.27	5.34	0.35	87.77	6.66	1.22	0.190	0.049
SCDMS with estem 2 stage cryo	13	0.21	9.29	0.09	37.89	4.79	1.16	0.207	0.062
SCDMS with estem 1 stage cryo	13	0	9.29	0.09	38.08	5.90	1.27	0.224	0.069
SCDMS with no estem cryo	0	0	8.18	0.17	47.01	6.31	1.32	0.233	0.073
SCDMS with estem 2 stage cryo, bigger estem	15	0.36	9.29	0.09	36.79	4.20	1.10	0.198	0.059

Notes Soudan Shield & IVC Estem lengths = 39.4 in., SCDMS Shield length = 74.75 in, SCDMS IVC length = 81.125 in.
SDMS Estem RT -> Shield and Shield -> IVC bellows are both doubled in length with respect to Soudan
Entire SCDMS Shield is modeled as wrapped in 20 layers of superinsulation
SCDMS model is equivalent to Matlab model from fridge "side access" flange to fridge cooling sources
Cryocooler temperatures should be achievable based on Schmitt and Lambin's Cryomech pulse tube test.

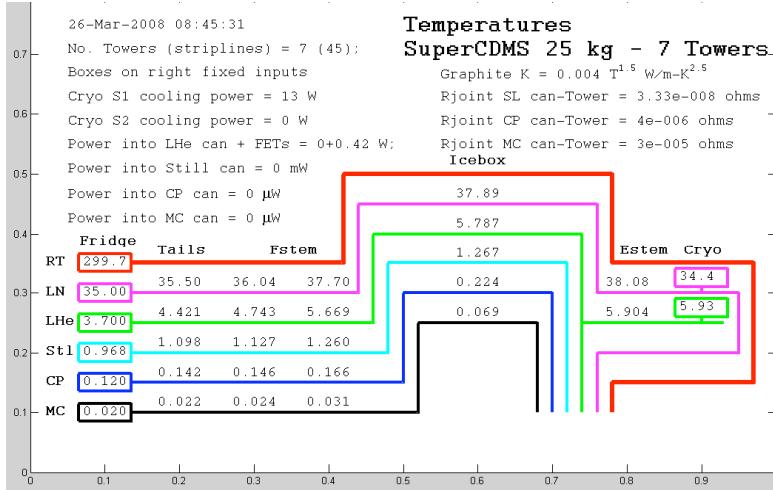
Soudan R122 with estem 2 stage cryo



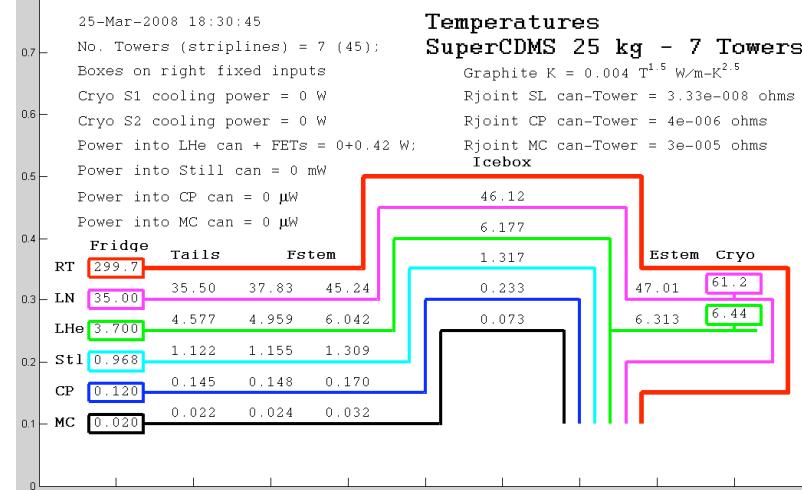
SCDMS with estem 2 stage cryo



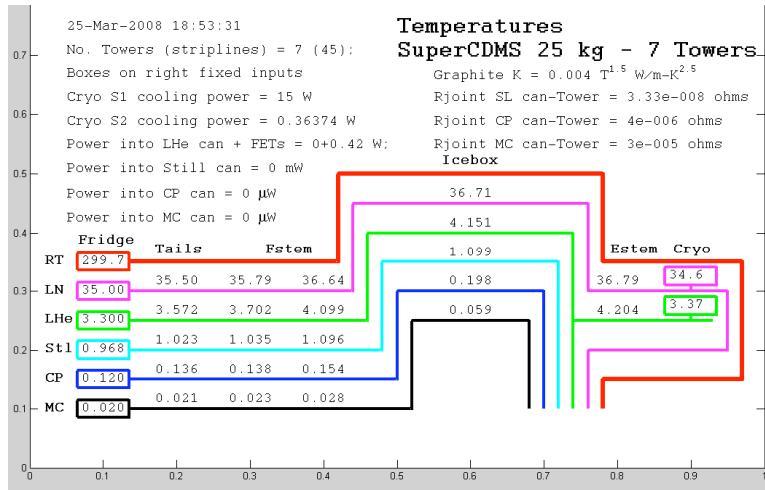
SCDMS with estem 1 stage cryo



SCDMS with no estem cryo



SCDMS with estem 2 stage cryo, bigger estem



Soudan R122 with estem 2 stage cryo

	micro-watts	% of Total Layer Heat Flow
ST layer total at fridge side access flange	4437	
Detector Coax and flyover wires	74.9	1.7
Kevlar bumpers	59	1.3
Kevlar hangers	5.7	0.1
Graphite tubes	4256	95.9
CP layer total at fridge side access flange	micro-watts	% of Total Layer Heat Flow
Kevlar bumpers	38.1	
1.6	4.2	
Kevlar hangers	0.08	0.2
Graphite tubes	36.7	96.3
MC layer total at fridge side access flange	nano-watts	% of Total Layer Heat Flow
Detector coax	490	
63.4	12.9	
Kevlar bumpers	15.9	3.2
Kevlar hangers	0.3	0.1
Nylon screws (horizontal cold finger)	9.6	2.0
Graphite tubes	404.5	82.6

SCDMS with estem 2 stage cryo

	micro-watts	% of Total Layer Heat Flow
ST layer total at fridge side access flange	2866.8	
Detector Coax and flyover wires	42.7	1.5
Kevlar bumpers	31.3	1.1
Kevlar hangers	18.3	0.6
Graphite tubes	2693.9	94.0
CP layer total at fridge side access flange	micro-watts	% of Total Layer Heat Flow
Kevlar bumpers	46.8	
1.4	3.1	
Kevlar hangers	0.5	1.0
Graphite tubes	45.3	96.6
MC layer total at fridge side access flange	nano-watts	% of Total Layer Heat Flow
Detector coax	800	
77.0	9.6	
Kevlar bumpers	17.6	2.2
Kevlar hangers	2.7	0.3
Nylon screws (horizontal cold finger)	10.1	1.3
Graphite tubes	690.7	86.3

Note: ST layer heat flow is lower than Soudan due to colder IVC layer