

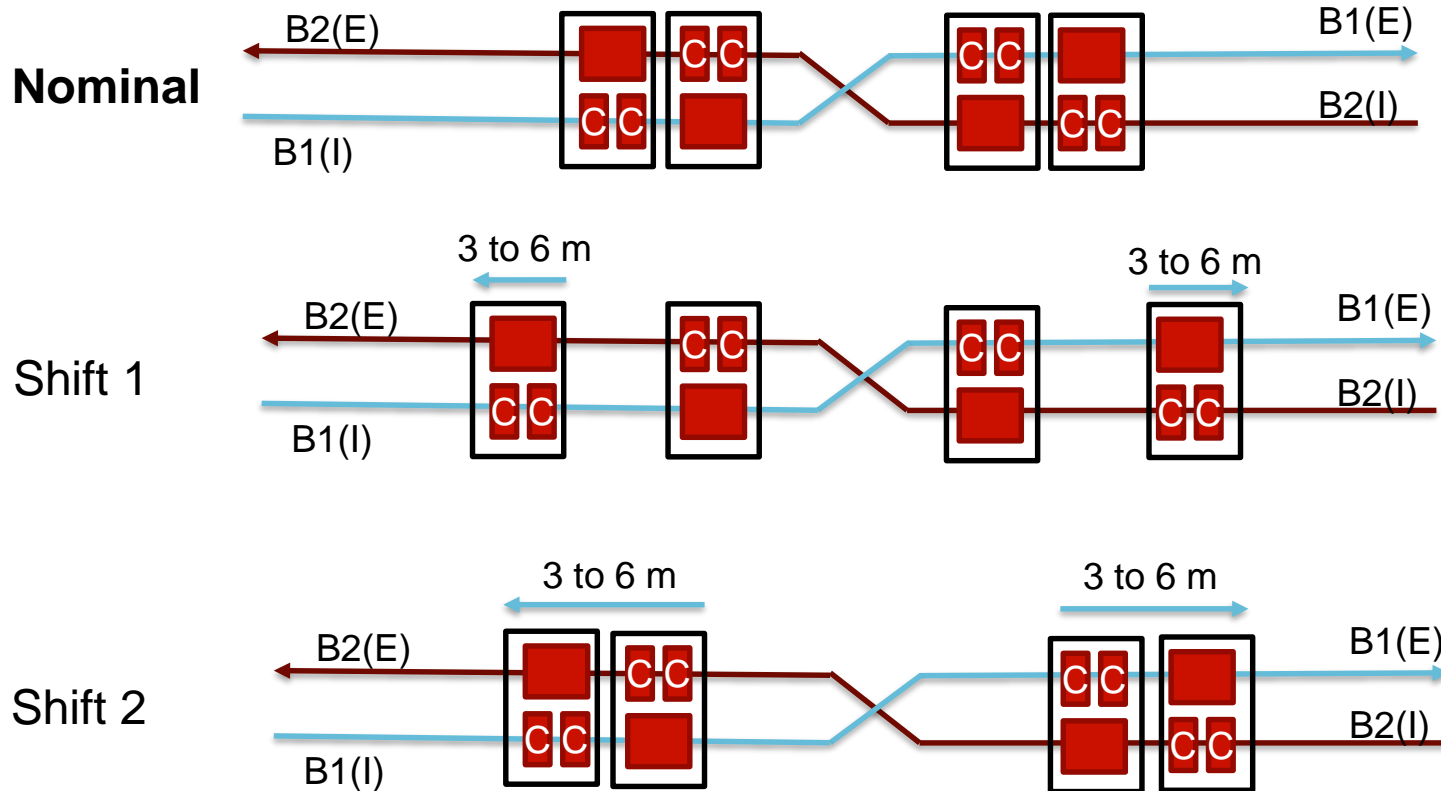


Crab layout options

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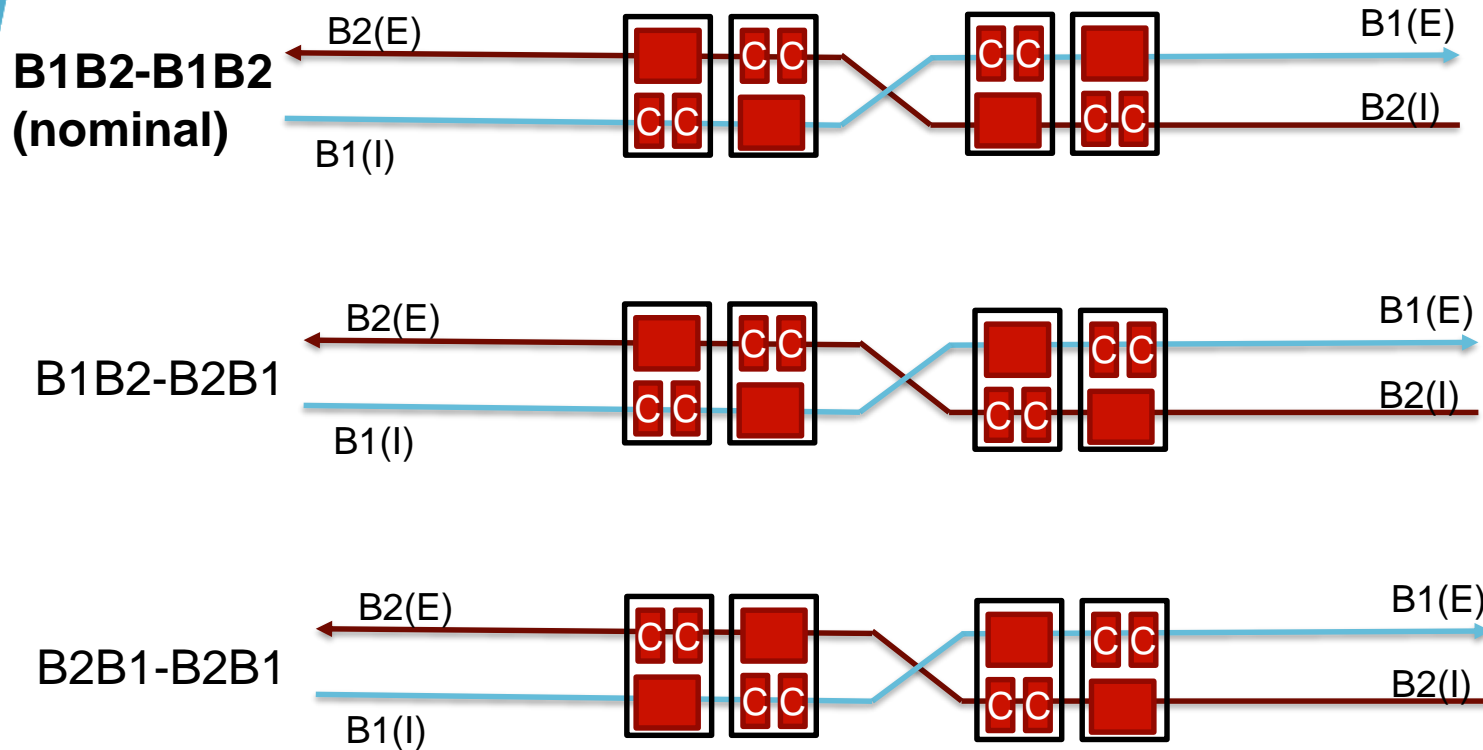
WP2 meeting 2/12/2018

Crab Layout: distance options



One spare per plane => cryomodule needs to fit when rotated.

Crab Layout: ordering option



One spare per plane => cryomodule needs to fit when rotated.

Crab Layout: crab angle

Layout	Crab H	Crab V	1==5	1!=5	HLB1	HRB1	HLB2	HRB2	VLB1	VRB1	VLB2	VRB2
	[μ rad]	[μ rad]	[μ rad]	[μ rad]	[MV]	[MV]	[MV]	[MV]	[MV]	[MV]	[MV]	[MV]
B1 B2 IP B1 B2	379.4	384.2	379.4	384.2	3.40	3.19	3.19	3.40	3.40	3.38	3.38	3.40
B1 B2 IP B2 B1	379.0	379.3	379.0	379.3	3.40	3.36	3.18	3.33	3.36	3.40	3.33	3.18
B1 3m B2 IP B1 3m B2	373.5	367.4	367.4	373.5	3.40	3.14	3.14	3.40	3.40	3.23	3.23	3.40
B1 3m B2 IP B2 3m B1	366.5	366.7	366.5	366.7	3.34	3.40	3.07	3.22	3.40	3.34	3.22	3.07
B1 6m B2 IP B1 6m B2	367.5	350.6	350.6	367.5	3.40	3.09	3.09	3.40	3.40	3.09	3.09	3.40
B1 B2 3m IP 3m B1 B2	373.2	367.1	367.1	373.2	3.40	3.27	3.27	3.40	3.40	3.28	3.28	3.40
B1 B2 3m IP 3m B2 B1	366.5	366.7	366.5	366.7	3.34	3.40	3.21	3.27	3.40	3.34	3.27	3.21
B1 B2 6m IP 6m B1 B2	366.9	350.0	350.0	366.9	3.40	3.36	3.36	3.40	3.40	3.18	3.18	3.40

Based on the same optics. Still possible optimizations for individual layouts.

Non closure (for 380 μ rad) is 0.029 σ (nominal) to 0.033 σ (worst case scenario +6m)

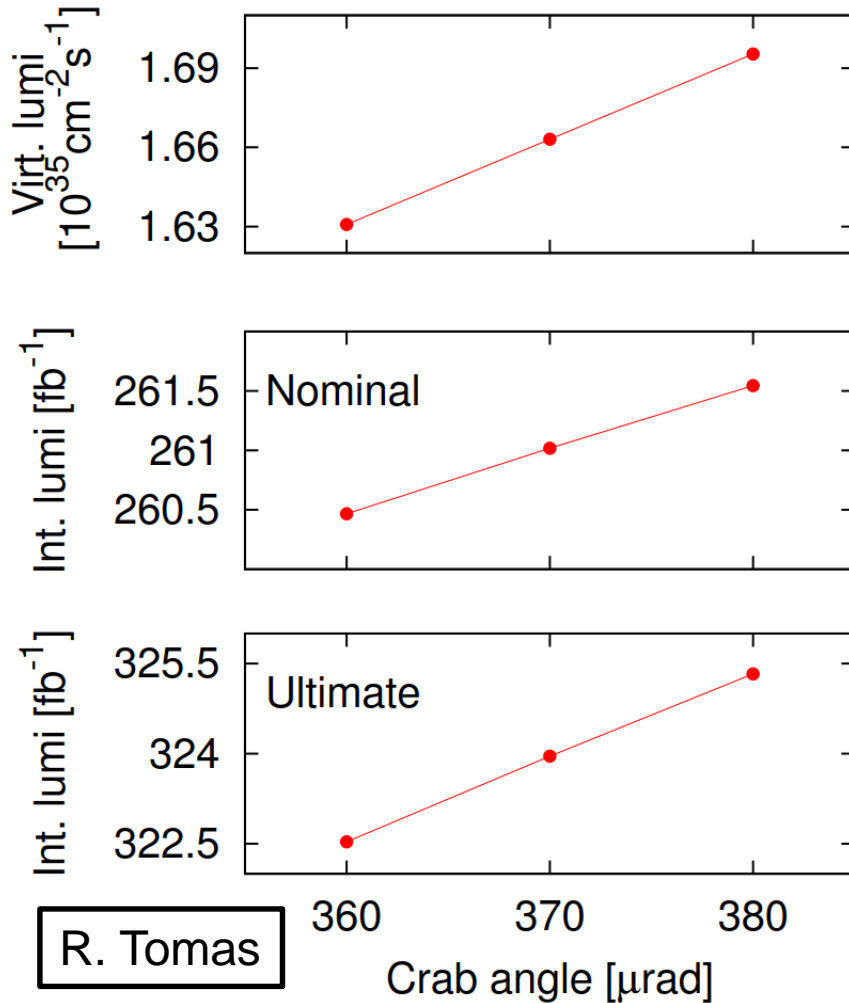
It is more efficient to have B2B1-B2B1 in IR1 and B1B2-B1B2 in IR5.

With 3 m shift 380 μ rad -> 366 μ rad (unless optimizing 1/5 -> 373 μ rad)

With 6 m shift 380 μ rad -> 350 μ rad (unless optimizing 1/5 -> 373 μ rad)

Moving one cavity gives the same penalty of one, but it gives it is better for sorting.

Luminosity vs Crabbing Angle



Crab angle	-5.5% (360 μrad)
Virt. Lumi	-3.6%
Int. Lumi [N]	-0.38%
Int. Luni [U]	-0.93%

Extrapolation

Crab angle	-8.5% (350 μrad)
Virt. Lumi	-5.6%
Int. Lumi [N]	-0.59%
Int. Luni [U]	-1.4%