

Coils from Optimized Contours

Optimized Contour Levels and Coil Currents
c10 Plasma at Full Beta (without EF Coils)

Case #Cont	Field Errors From Filaments, %		VMEC Free Boundary to Fixed Boundary Separation, mm			Max Current Density In Coil Bundle, MA/m		% change
	Max	Mean	Max	Mean	<M>	t=0	t=8mm	
11	2.912	0.514	36.9	9.7	2.702	2.86	4.18	-24.73
10	3.429	0.514	13.4	2.9	2.364	2.66	3.92	-29.48
10x	2.487	0.521	19.9	3.0	2.438	3.10	5.44	-2.13
16 (Ref)	2.573	0.544	28.2	6.4	2.295	2.91	5.56	0.00

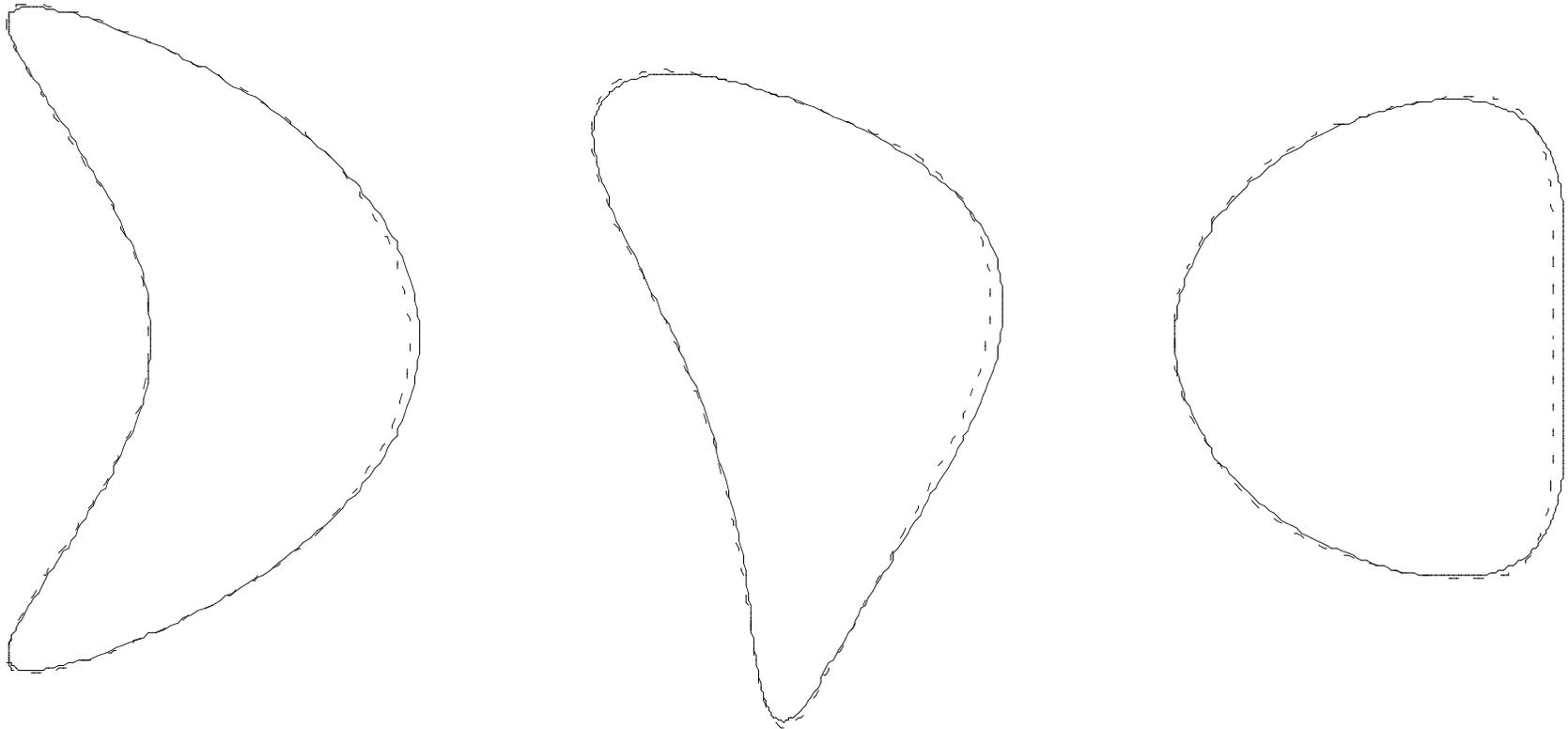
- Notes:
- 1) Cases 11, 10 and 10x were Optimized by Neil Pomphrey
(cases 11 & 10 were optimized to minimize Bmean, case 10x minimizes Bmax
 - 2) Case 16 is the reference configuration with equal contour level increments and equal currents
 - 3) All coils on "185" surface (185 mm offset from plasma on inboard, 205 mm outboard)
 - 4) t=0 assumes no structure between coils, t=8 assumes 8mm of structure between coils

Coil Currents and Separation for 10 optimized contours

Coil Number		Coil Current, KA		Minimum Separation	Current Density
First	Second	First	Second	cm	MA/m
4 6	4 4	43.7	43.7	1.97	3.7
4 8	1	43.7	43.7	1.92	3.9
5	4 6	88.3	43.7	2.48	3.9
1 1	5	119.0	88.3	4.37	2.9
1 4	1 1	97.7	119.0	4.47	3.0
2 0	1 4	91.0	97.7	6.95	1.5
3 0	1 1	97.7	119.0	6.83	1.8
4 0	4 6	88.3	43.7	10.66	0.7
4 0	4 8	88.3	43.7	8.73	0.8

Reconstruction of c10

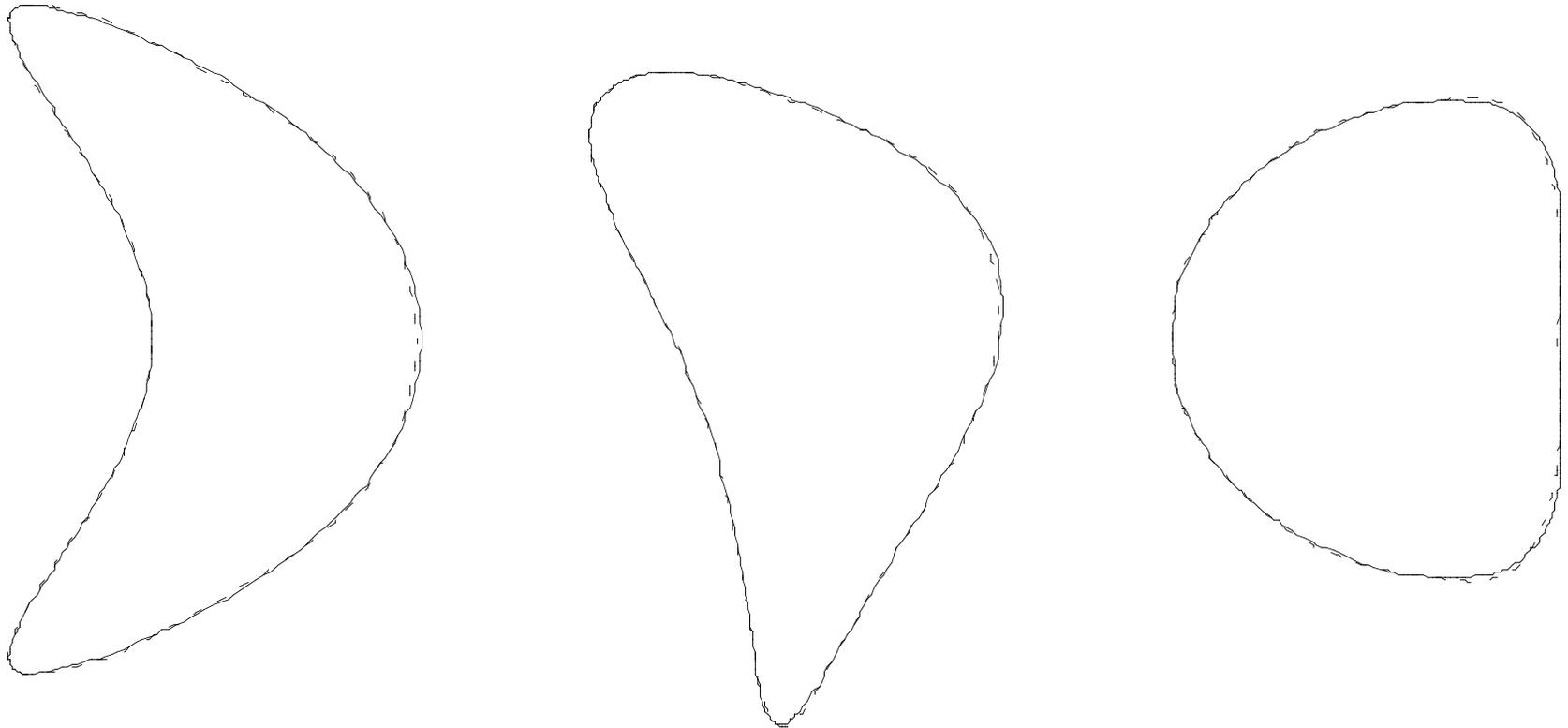
16 uniform contours



Reconstruction of c10

10 optimized contours

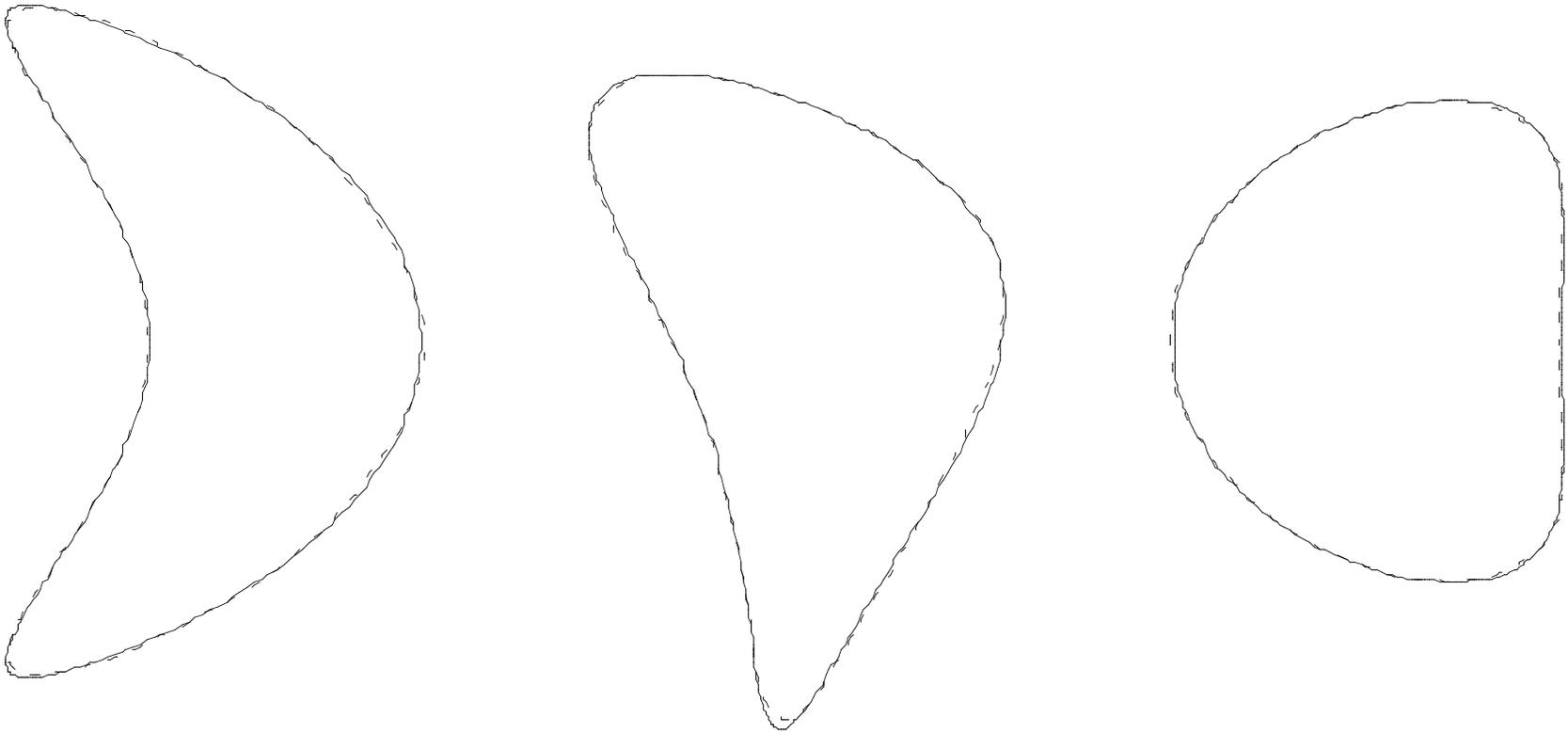
Optimized to minimize Bmean



Reconstruction of c10

10 optimized contours

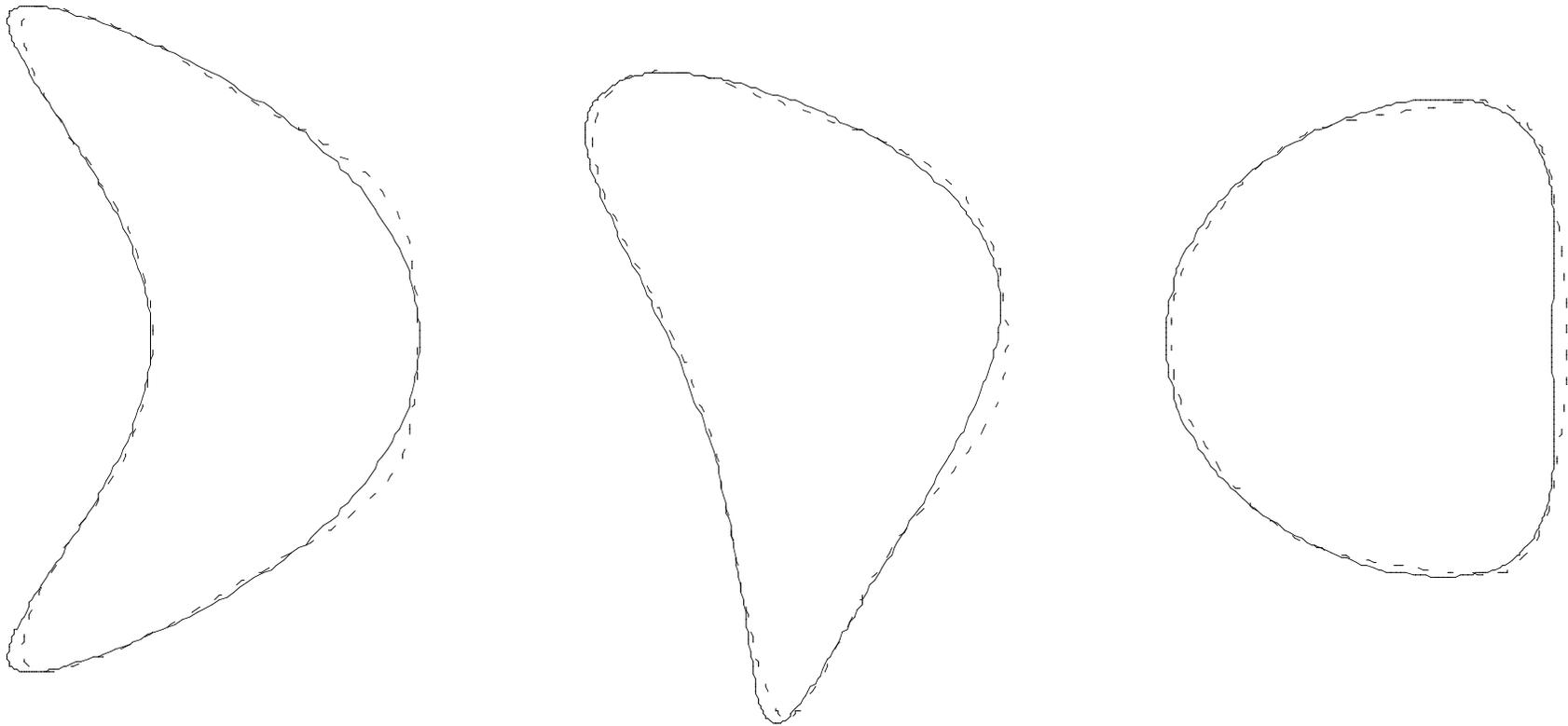
Optimized to minimize B_{\max}



Reconstruction of c10

11 optimized contours

Optimized to minimize Bmean



_3_c10a filamentdump.sad185n2.10

3.43% Max Err. 0.51% Mean Err. 0.30cm Min Dist

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