Discussion: HERA Dipole Magnet Pole Shoe Design

Optimized by CST Studio

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Dipole Magnet Pole Shoes

Design and Field

Shims

- added for B-field flatness
- 4 shims (2 inners & 2 outers)



- Original file from Mikhail
- Magnetic Solver
- Minimum 5 passes, each doubles meshes in *x*, *y*, *z*
- More details in CST file





Optimizer in CST Studio

Error function and flatness

• Minimizing an Integral of error function from -50 to 50 mm

Optimize	r					- [C
Simulation Settings	type: M-Static Sol Goals Info	ver	~	Acceler	ation		
Algorithm: Trust Region Framework V Properties General Properties							es
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X	dx_na	16	24	19.5	22.7	22.7	
X	dx_ni	9	16	12	9.2	9.2	-
X	dy_na	1	3	1.6	2.4	2.4	_
×	dy_ni	1	3	1.7	2.5	2.5	-
	h	40	60	51.5	51.5	51.5	-
	hgap	139.5	170.5	155	155	155	
	i	-3.85	-3.15	-3.5	-3.5	-3.5	
	zjoch	180	220	200	200	200	
	700	270	330	300	300	300	~
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Result



Note

- Refinement factor of pole shoe components is changed from 3 in the originals to 10
- After 5 passes of refinement, B_{v} trends are still not converging
- Simulation with 6 passes may take longer than a day during a parallel computing with 8 Cores

Discussion

Backup: Result

