

Table for Alignment of Inner Triplet Quadrupole Magnetic Axes

	AP Requirements	Mechanical Tolerances	Measurement and Survey Accuracy	
1a) Single MQX cold mass	Not limiting as long as $\langle \rangle = 0$. Needs further study		Mechanical meas. Not limiting	
Straightness H and V		100 $\mu\text{m}/\text{meter}$		
Twist		1mrad/5 meter		
1b) Single multilayer corrector field	Moved to 2b			
2a) Relative alignment of MQX magnets in composite Q2		Mechanical tests scheduled starting in 2000	<i>Mech. and stretch wire with survey equip.</i>	
Q2a/Q2b transverse alignment	500 μm		100 μm	
Q2a/Q2b relative roll	1 mrad (rms)		100 μrad (rms)	
Q2a/Q2b relative pitch and yaw	100 μrad		130 μrad	
2b) Relative alignment of corrector in a composite Q2 and Q3			Should be able to do with mech measurements	
Corrector displacement	500 μm			
Corrector roll	5 mrad			
3) Placement of composite coldmass into cryostat and relating magnetic axis to external fiducial			Only includes errors relating magnetic axis to external fiducials	
Q1 Displacement transverse	300 μm	Within limits, correctable if adjustments made to cryostat jacks, if fiducials are stable. Mechanical tests scheduled for 2001		180 μm
Displacement longitudinal	~1mm			
Roll angle	200 μrad (rms)			100 μrad (rms)
Pitch/Yaw				130 μrad
Q2 Displacement transverse	300 μm			180 μm
Displacement longitudinal	~1mm			
Roll angle	100 μrad (rms)			100 μrad (rms)
Pitch/Yaw				130 μrad
Q3 Displacement transverse	300 μm			180 μm
Displacement longitudinal	~1mm			
Roll angle	100 μrad (rms)			100 μrad (rms)
Pitch/Yaw				130 μrad