

Final Focus Lens Study Short History

2002~2005 基盤研究(A)

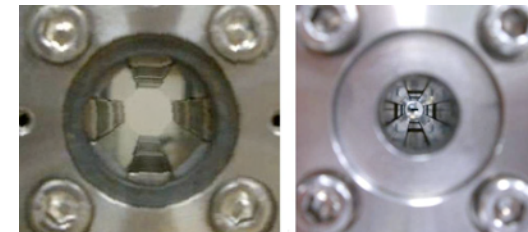
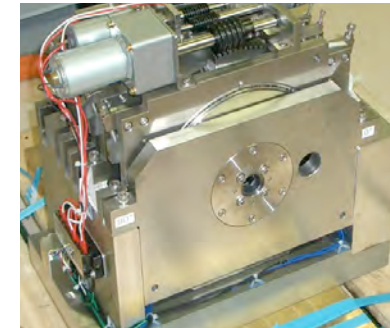
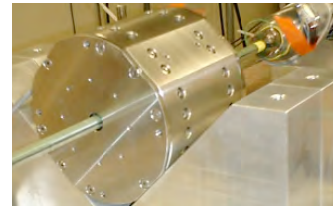
超強力永久磁石によるリニアコライダー用最終集束レンズ

2002 固定型四極磁石製作

2003 可変型四極磁石製作(二重リング)

2004 可変型四極磁石測定

2005 ボア縮小による高強度化実証、測定器開発



2006~2009 基盤研究(A)

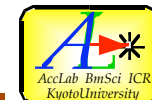
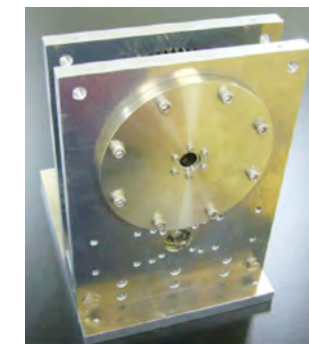
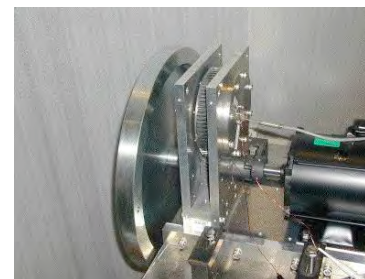
超強力永久磁石の開発とその応用、特にリニアコライダーと中性子光学への新展開

2006 冷中性子集束用同期型六極磁石1/2モデル製作

2007~ 可変型四極磁石製作(2号機)

2008 六極磁石実寸モデル製作

2009 詳細測定及びまとめ



JLC-I parameters

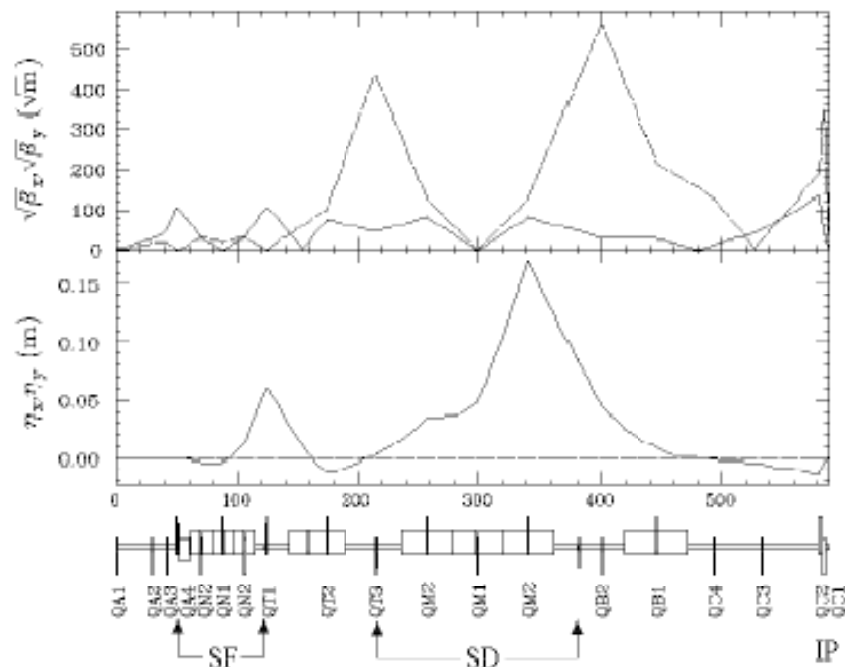
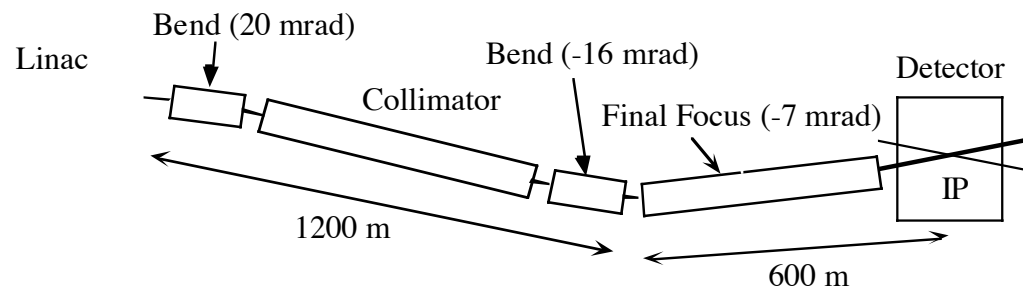
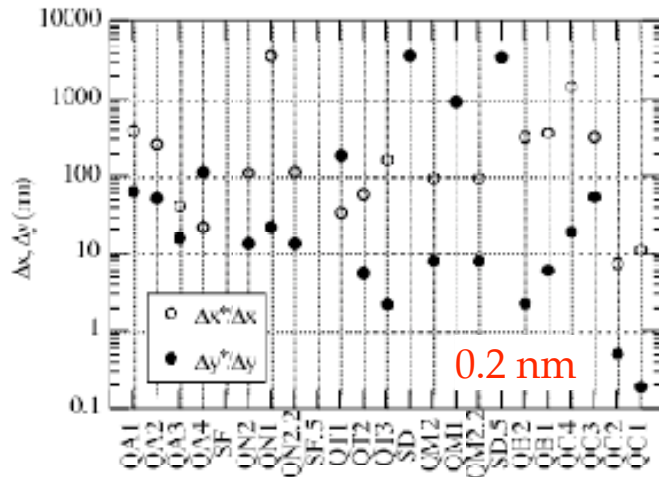


Table 4.24: Parameters of the JLC final focus system

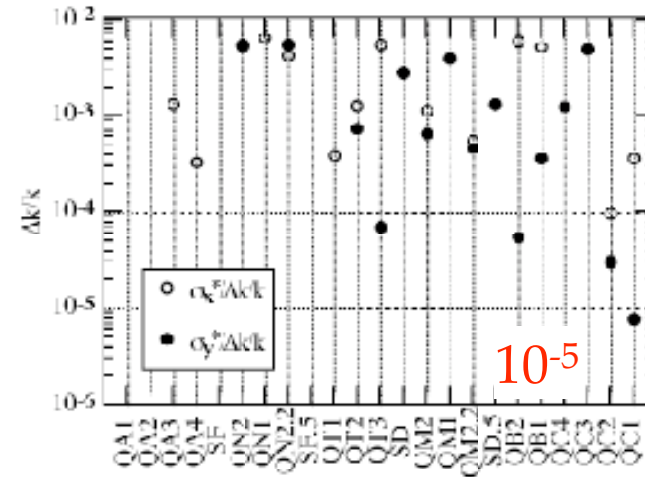
Beam energy	E_0	250	GeV
Incoming invariant emittances	ϵ_x/ϵ_y	$3.6 \times 10^{-6}/5.0 \times 10^{-8}$	m
Invariant emittances at IP	ϵ_x/ϵ_y	$3.8 \times 10^{-6}/6.0 \times 10^{-8}$	m
β functions at the IP	β_x^*/β_y^*	10/0.1	mm
Spot sizes at the IP	σ_x^*/σ_y^*	280/3.5	nm
Free area length	ℓ^*	2.5	m
Half aperture of the final quad	a	6.8	mm
Pole-tip field	B_0	1.3	T
Length of the final quad	L_1	2.2	m
Chromaticities of final lenses	ξ_x/ξ_y	3200/43000	%
Momentum bandwidth	χ_m	± 0.8	%
Total bend angle	θ	7.1	mrad
Length/beam	L_0	590	m



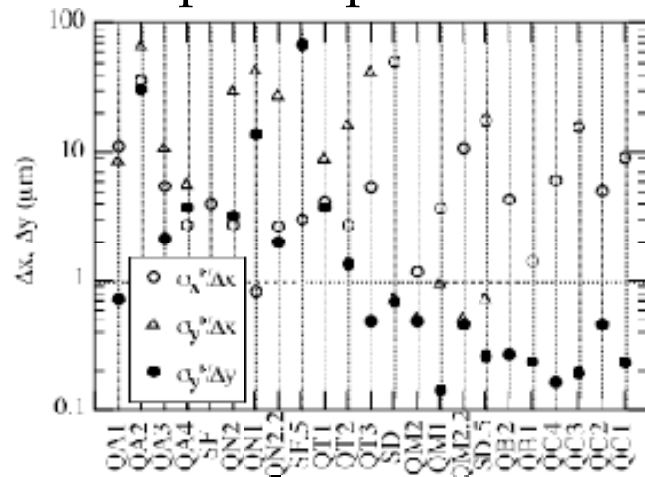
Tolerances (JLC-1)



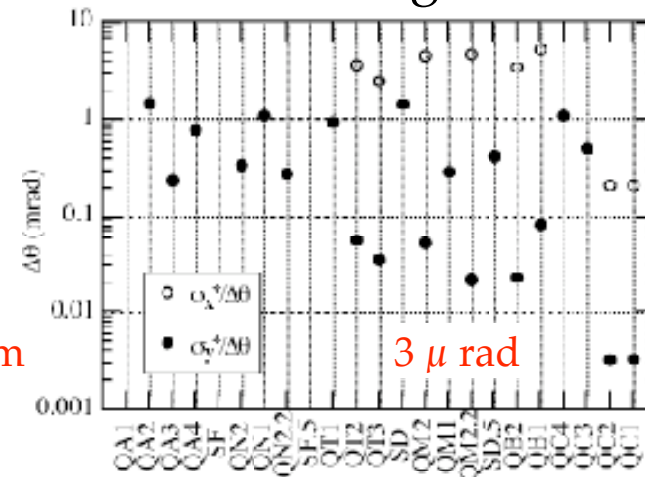
Spot displacement



Strength



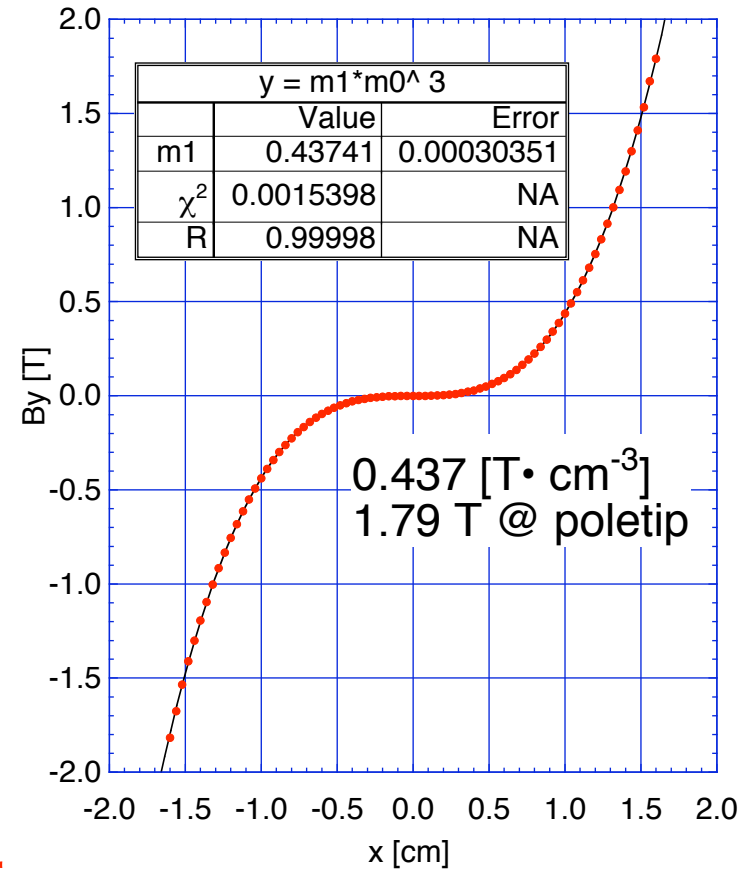
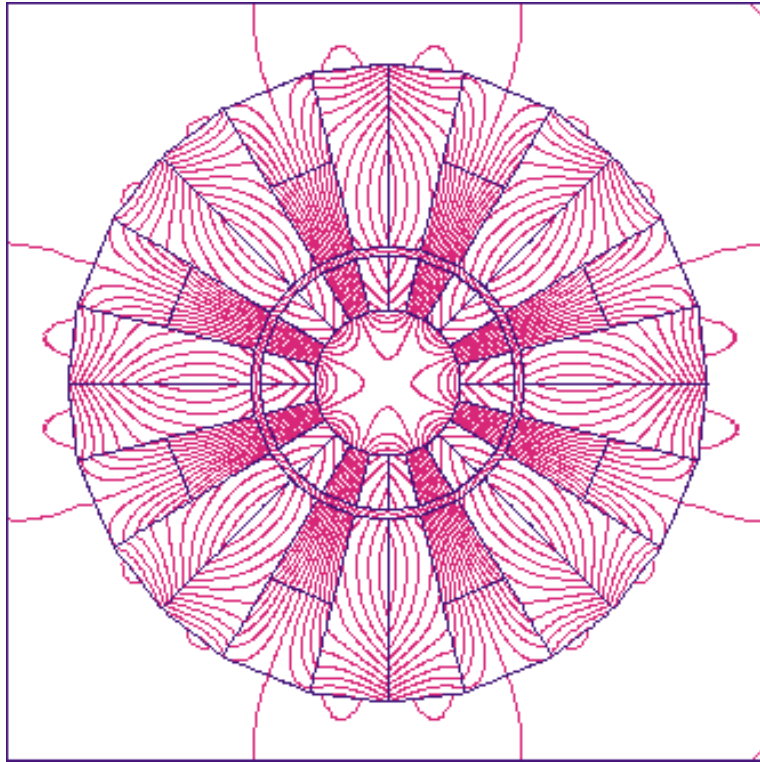
Spot size



Skew



PM-Octupole for tail-folding



Bore \varnothing 32, Size \varnothing 150 for ATF2

ILC: Baseline Sc design: 0.5T@pole tip, 1TeVCM

PMO can be strong; shorter in length.

