Nuclear
Physics
Laboratory

KOREA UNIVERSITY

Design of Dipole & Quadrupole Magnets

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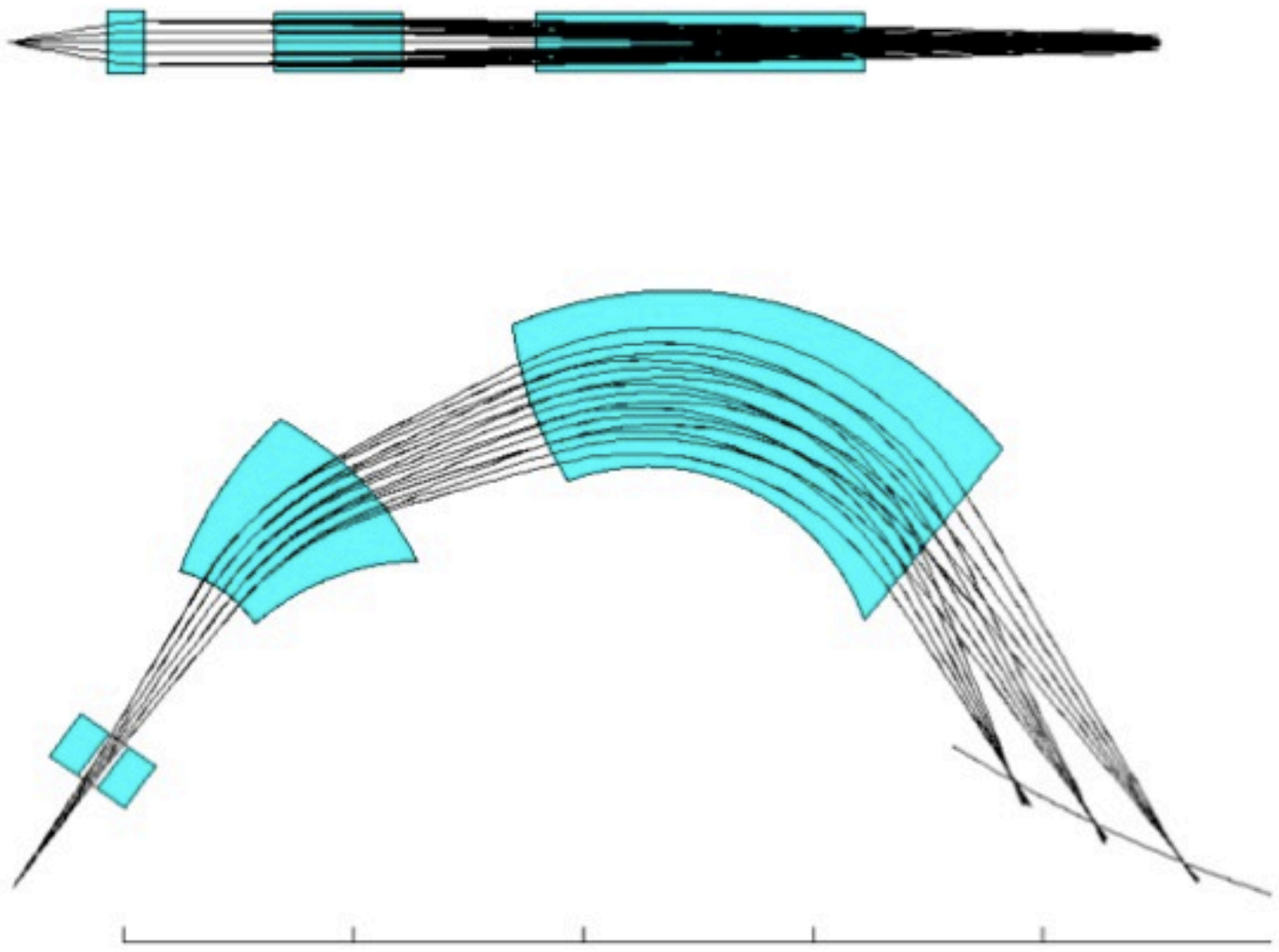
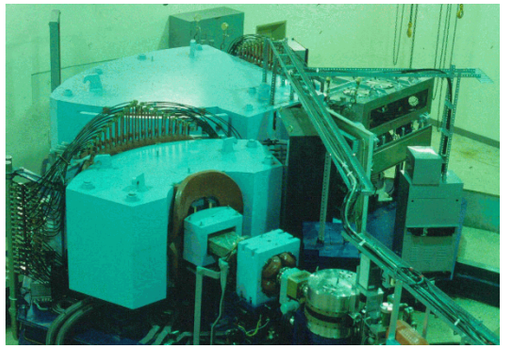
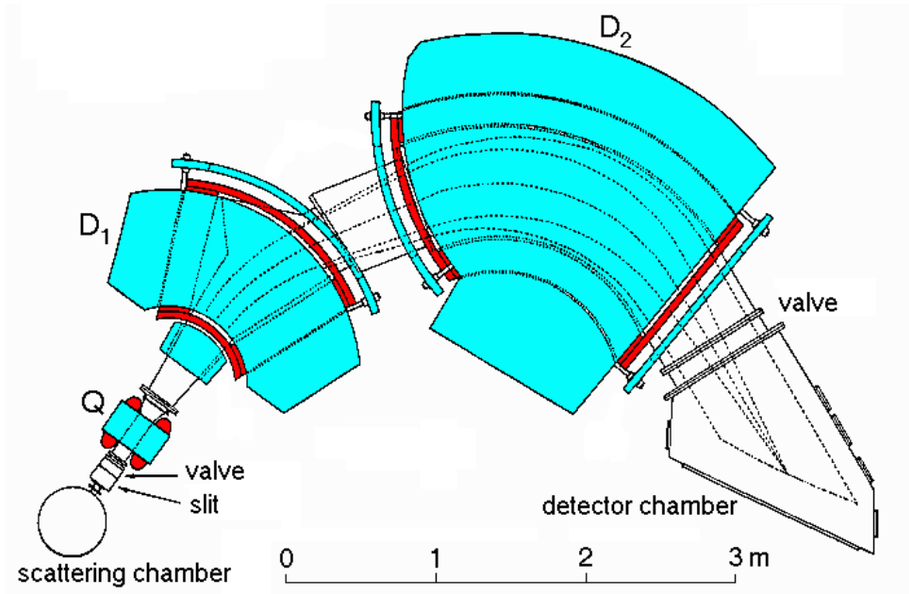
[QDD spectrometer]





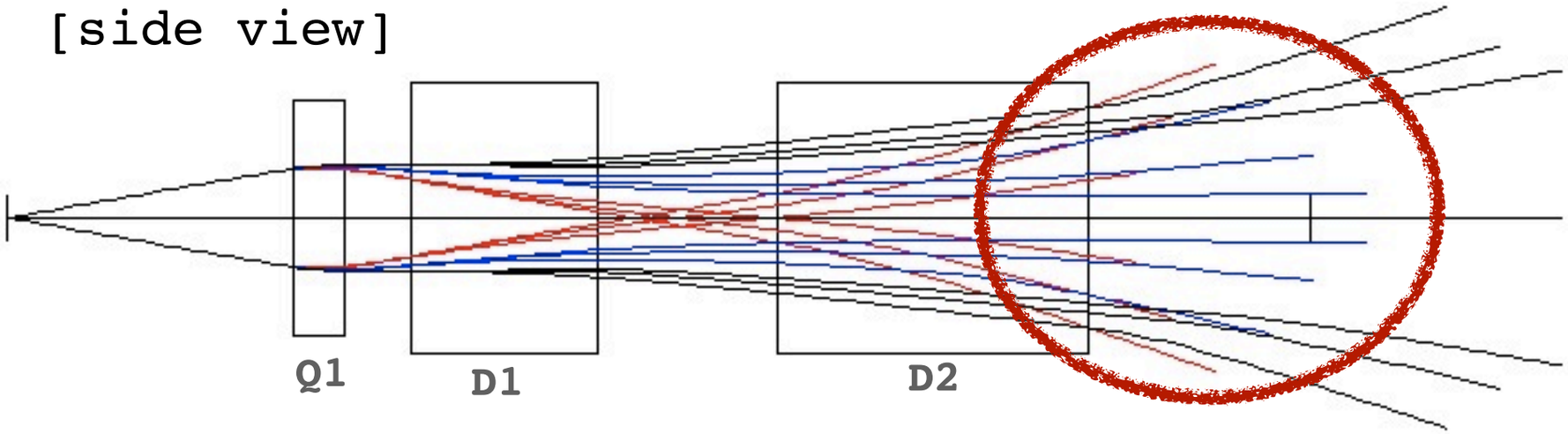
Spectrometer at INS SF cyclotron



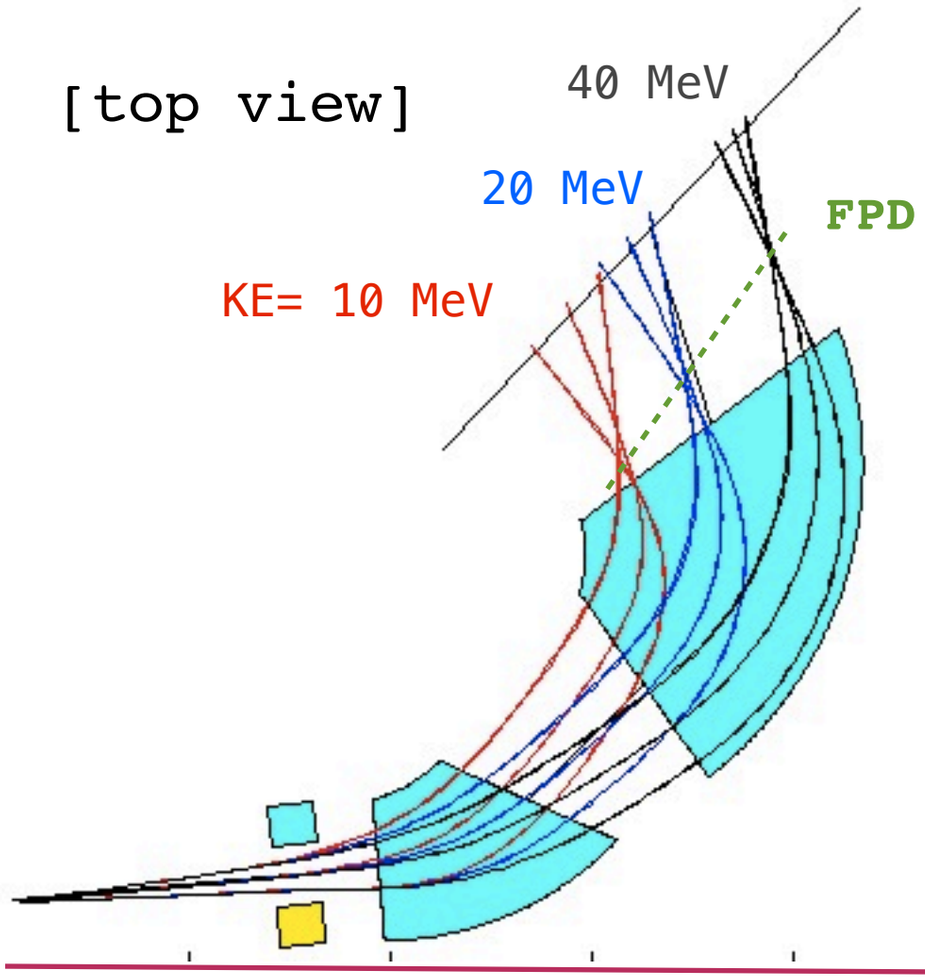
分散(dispersion)	3.9 m
横倍率(horizontal magnification)	-0.4
縦倍率(vertical magnification)	-4.4
運動量分解能(first-order momentum resolution)	1/10000
最大立体角(maximum solid angle)	6.4 msr
軌道半径(orbit radius)	1.3 - 1.5 m
エネルギー帯域(energy range)	30 %
四極電磁石磁極間隙(pole gap of quadrupole magnet)	10.6 cm
双極電磁石磁極間隙(pole gap of dipole magnet)	10 cm
最大磁場(maximum field)	1.27 T
電磁石重量(magnet weight)	38 ton

QQD : K-Trace

[side view]



[top view]



* energy range: ±60% (10-40 MeV)
* momentum range: ±34% (137.4-276.9 MeV/c)
* solid angle:9.9 msr

1.3m ->Q1-> 0.292m ->D1-> 0.811m ->D2-> 1m ->C

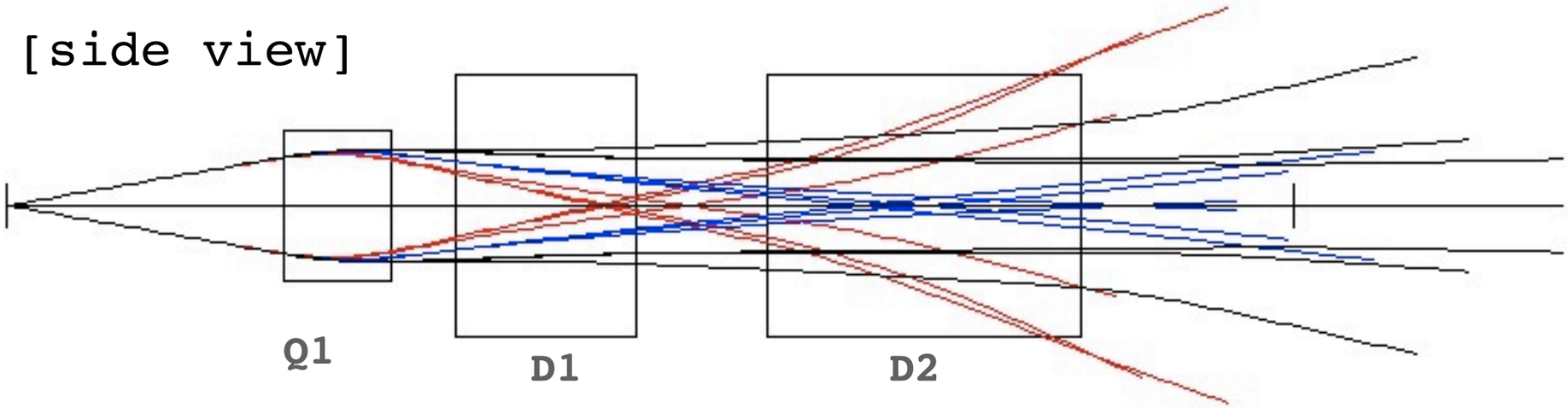
***Q1** : L=23cm, a=30cm, B=+2.0T/m (y-focusing)

***D1** : θ=40.0°, gap=35cm, w1=70cm, w2=90cm,
R=1.20m, B = -0.47T, β_1=0, β_2=21°

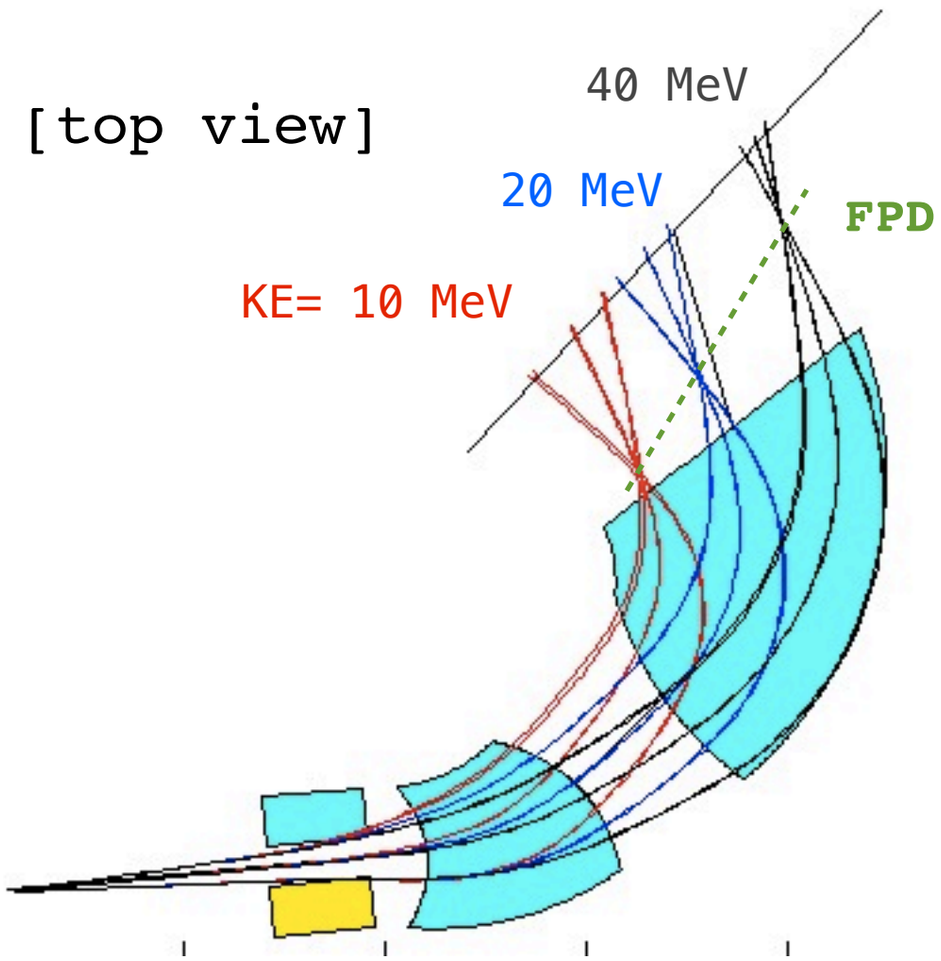
***D2** : θ=61.8°, gap=35cm, w1=1.1m, w2=1.5m,
R=1.30m, B = -0.57T, β_1=-10°, β_2=21°

QQD : K-Trace

[side view]



[top view]



* energy range: ±60% (10-40 MeV)
* momentum range: ±34% (137.4-276.9 MeV/c)
* solid angle:9.9 msr

1.3m ->Q1-> 0.292m ->D1-> 0.811m ->D2-> 1m ->C

***Q1** : L=50cm, a=20cm, B=+1.35T/m (y-focusing)

***D1** : θ=40.0°, gap=35cm, w1=70cm, w2=90cm,
R=1.20m, B = -0.47T, β_1=0, β_2=0°

***D2** : θ=61.8°, gap=35cm, w1=1.1m, w2=1.5m,
R=1.30m, B = -0.57T, β_1=-10°, β_2=21°

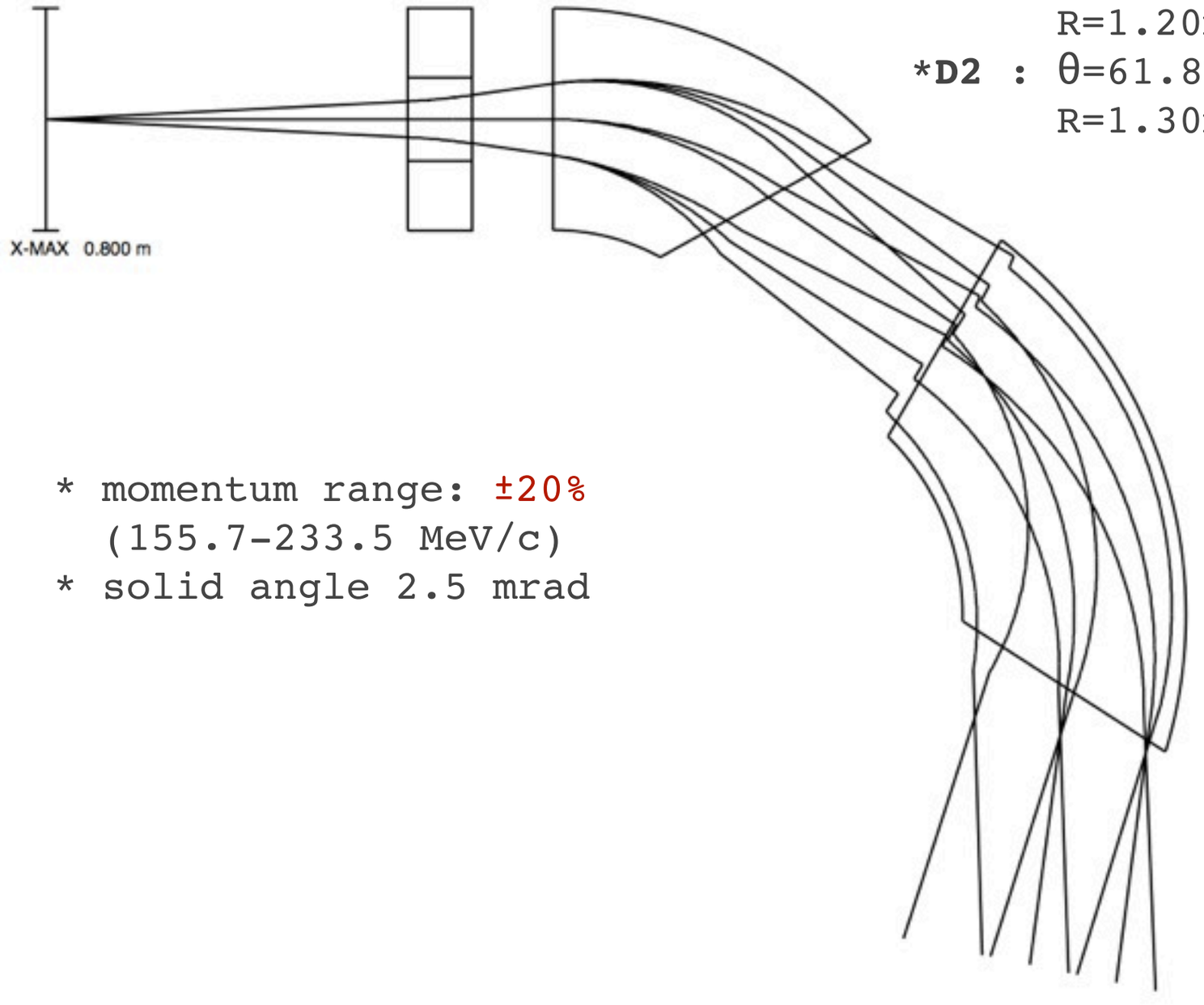
QQD (GICOSY)

1.3m ->Q1-> 0.292m ->D1-> 0.811m ->D2-> 1m ->C

***Q1** : L=23cm, a=30cm, B=+0.6T (y-focusing)

***D1** : θ=40.0°, gap=50cm, w1=70cm, w2=90cm,
R=1.20m, B = -0.47T, β_1=0, β_2=21°

***D2** : θ=61.8°, gap=50cm, w1=1.1m, w2=1.5m,
R=1.30m, B = -0.57T, β_1=-10°, β_2=21°



* momentum range: ±20%
  (155.7-233.5 MeV/c)
* solid angle 2.5 mrad