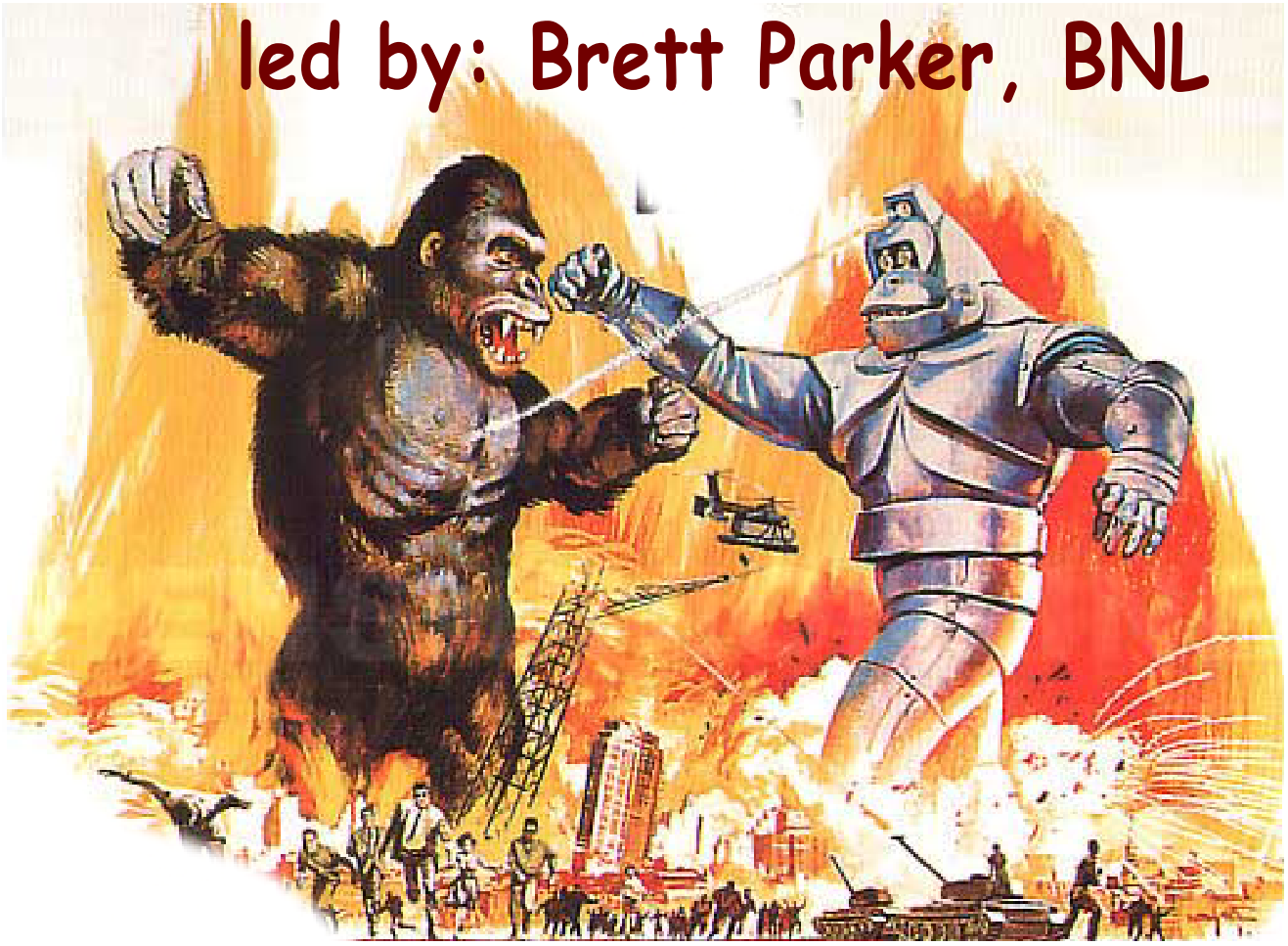
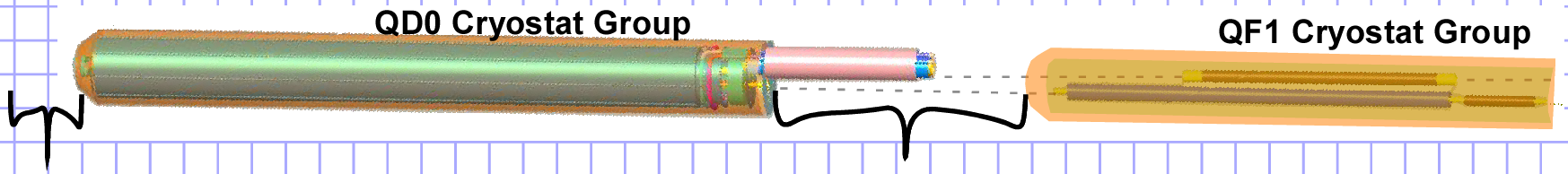
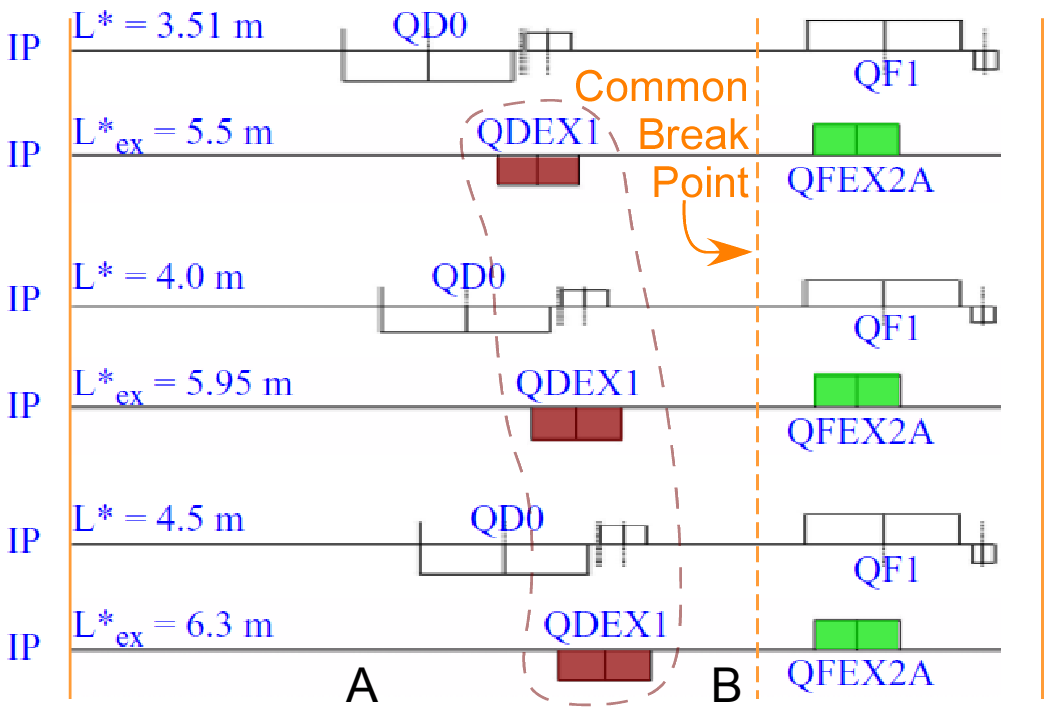
BROOKHAVEN NATIONAL LABORATORY
Superconducting Magnet Division

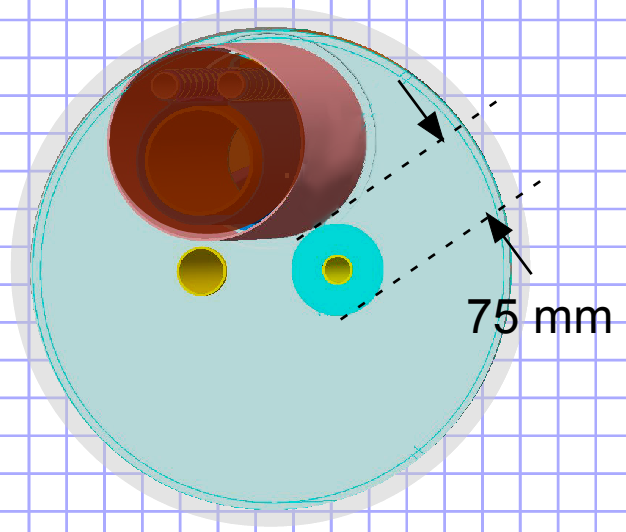
Discussion of IR Beam Space Real Estate

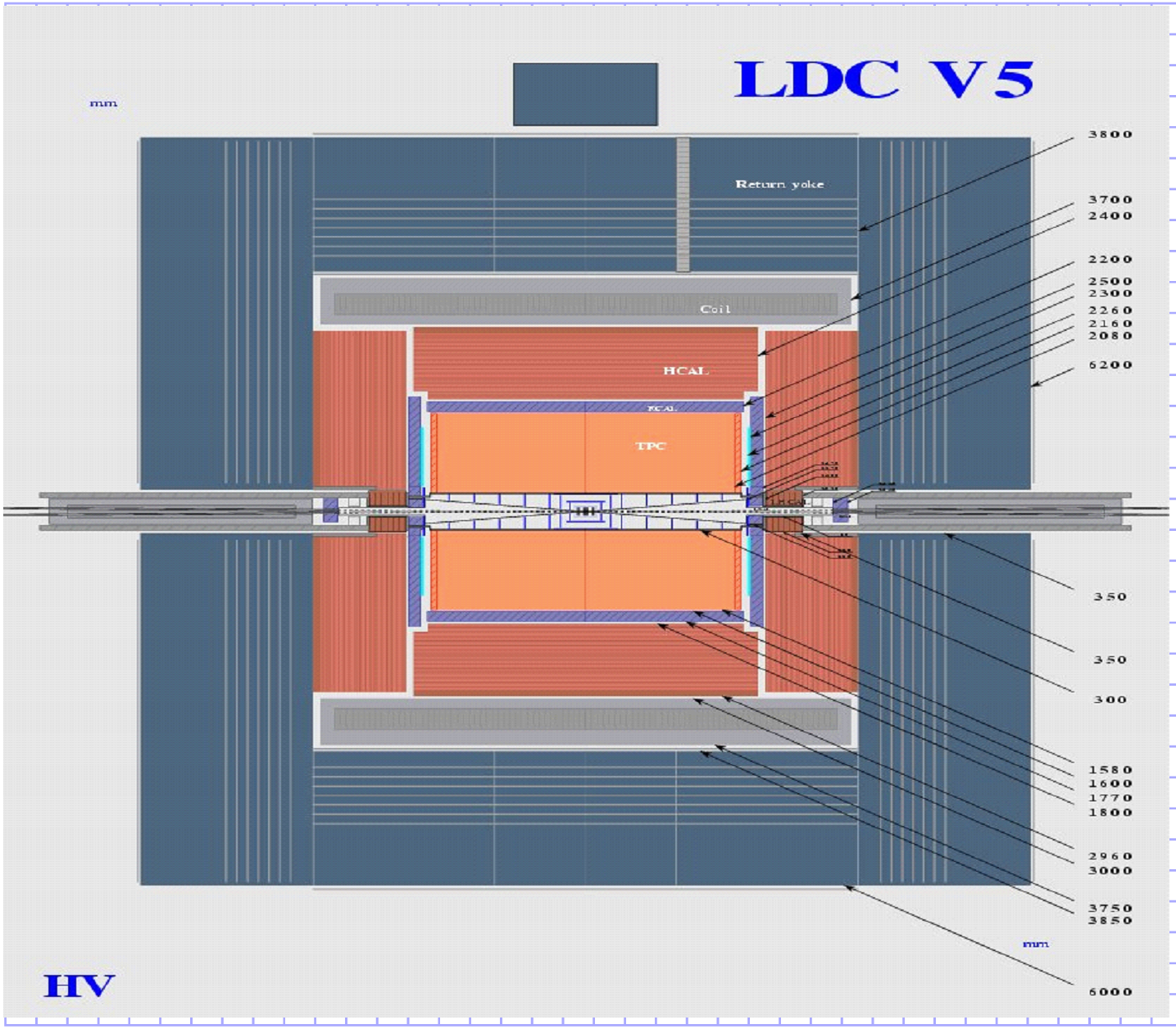
led by: Brett Parker, BNL

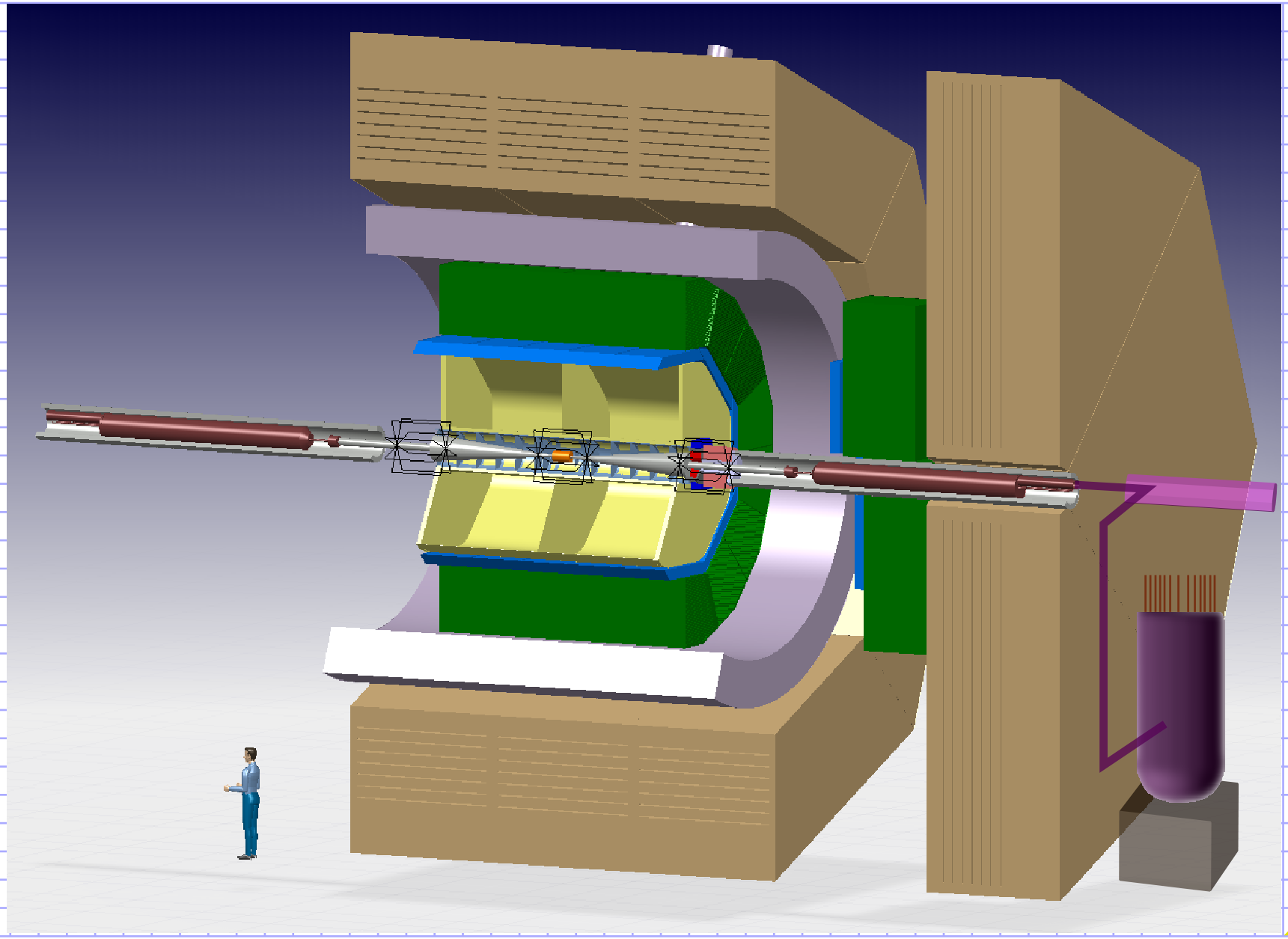


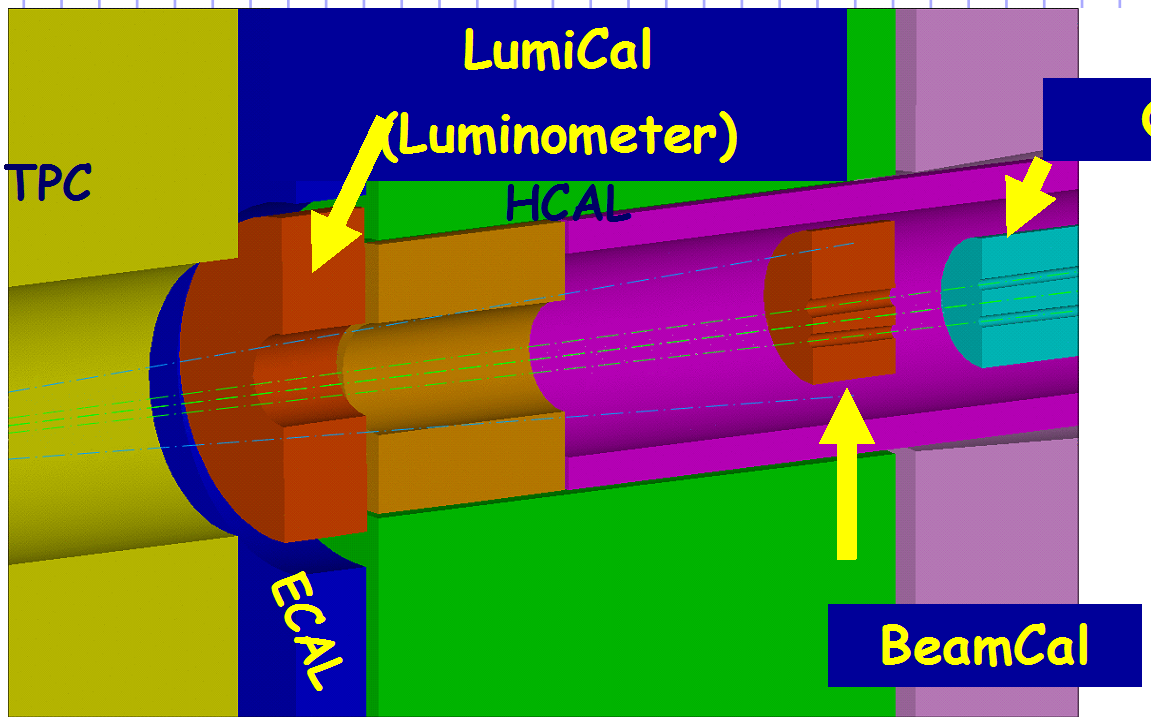

QD0 Cryostat Group
QF1 Cryostat Group
A (100-200 mm)
B (1200-2200 mm)

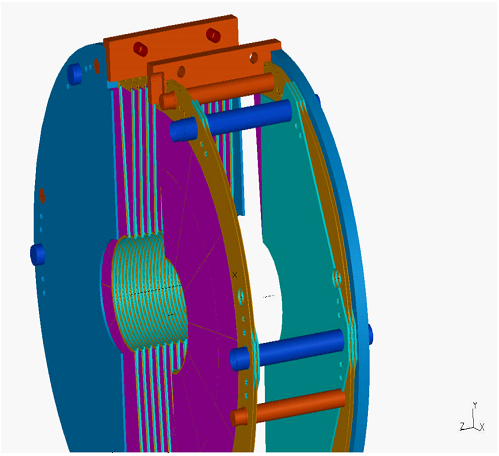

IP
L* = 3.51 m
QD0
QF1
Common
Break
Point
IP
L*ex = 5.5 m
QDEX1
QFEX2A
IP
L* = 4.0 m
QD0
QF1
IP
L*ex = 5.95 m
QDEX1
QFEX2A
IP
L* = 4.5 m
QD0
QF1
IP
L*ex = 6.3 m
QDEX1
QFEX2A
A
B

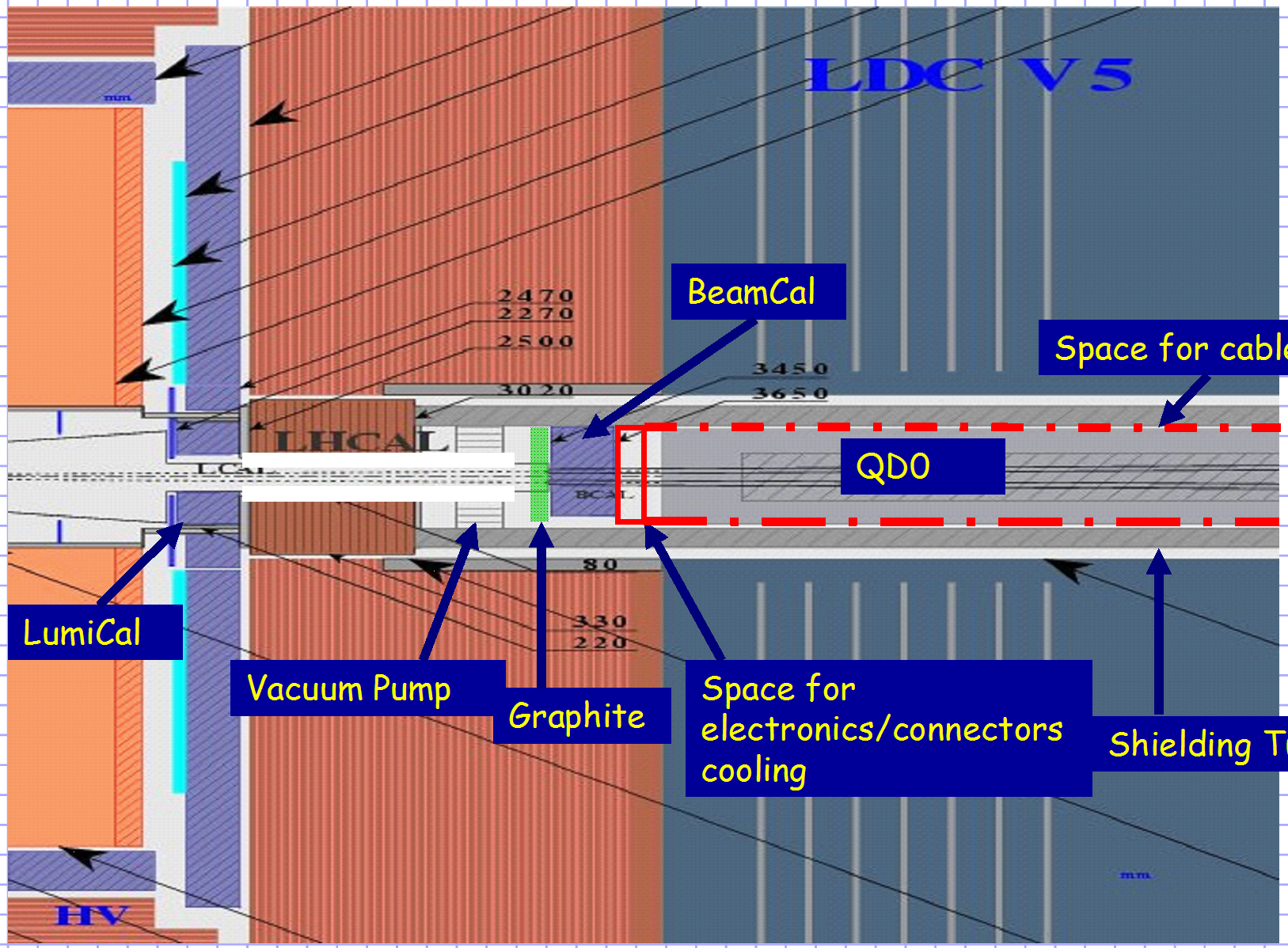

75 mm


LDC V5
mm
Return yoke
Coil
HCAL
ECAL
TPC
3800
3700
2400
2200
2500
2300
2260
2160
2080
6200
350
350
300
1580
1600
1770
1800
2960
3000
3750
3850
mm
6000
HV

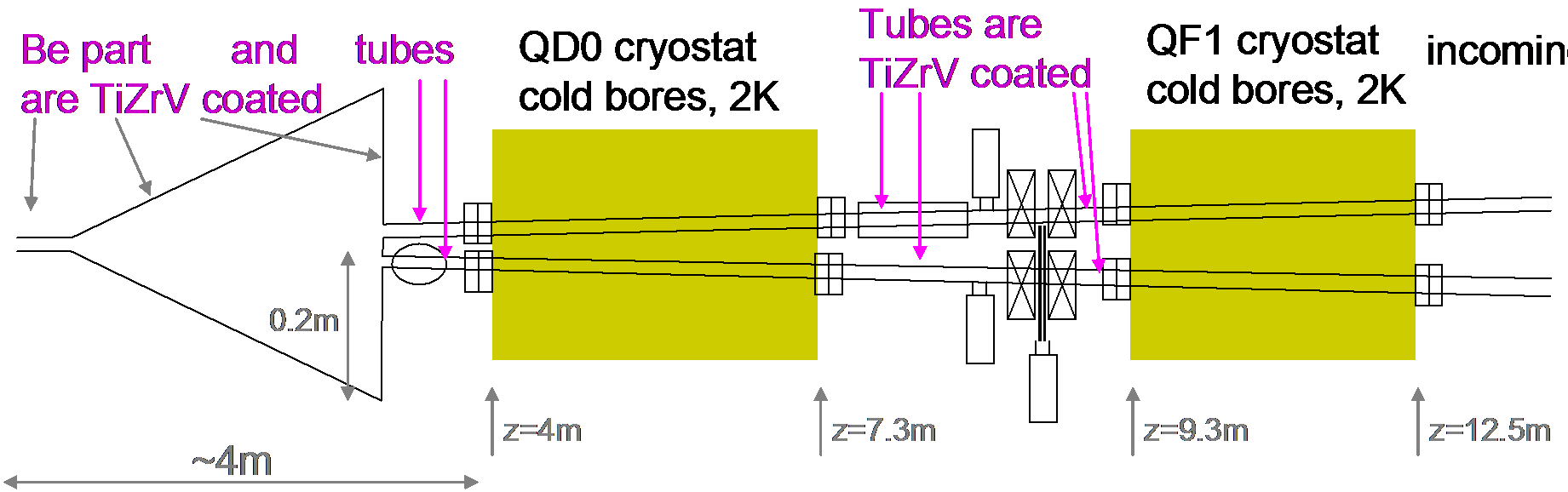



LumiCal
(Luminometer)
TPC
HCAL
ECAL
BeamCal
QD0




LDC V5
2470
2270
2500
3020
3450
3650
LHCAL
BCAL
80
330
220
HV
BeamCal
Space for cables
QD0
LumiCal
Vacuum Pump
Graphite
Space for
electronics/connectors
cooling
Shielding Tube

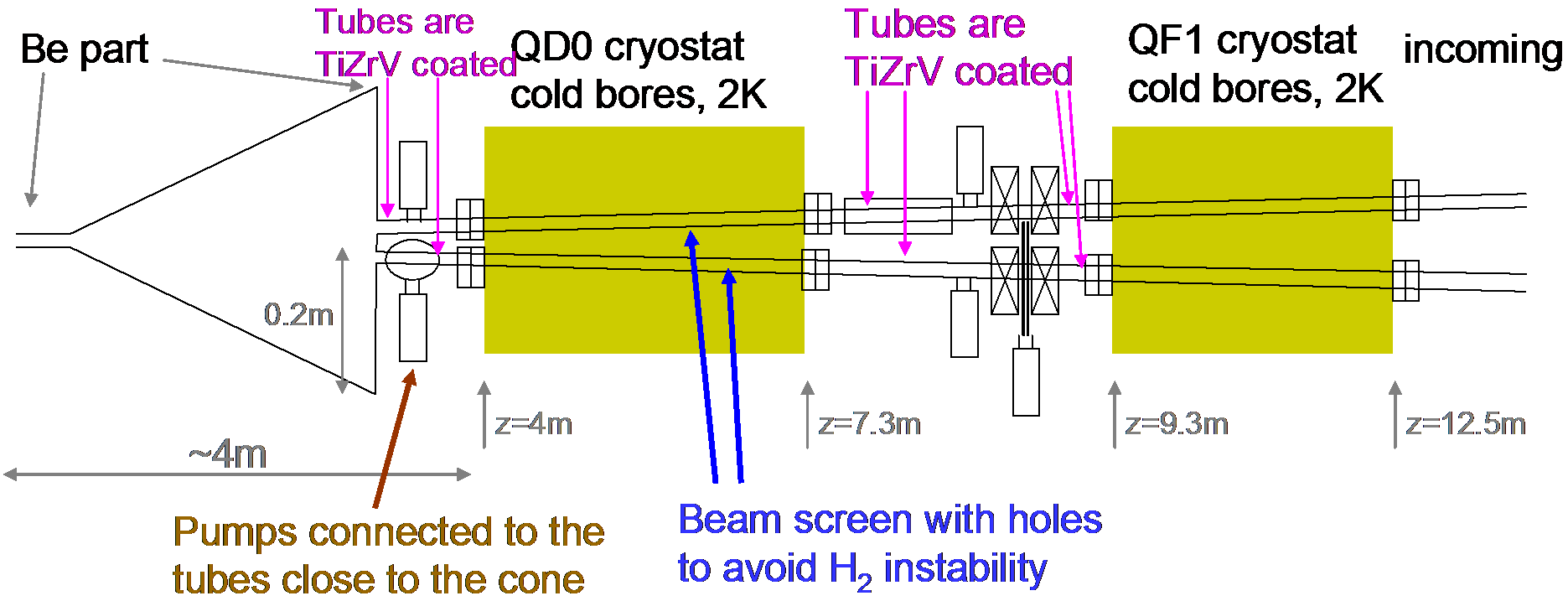
Two possible solutions: solution 1



Legend:

- pump
- BPM, strip-line
- kicker, strip-line
- bellows
- valve
- flanges

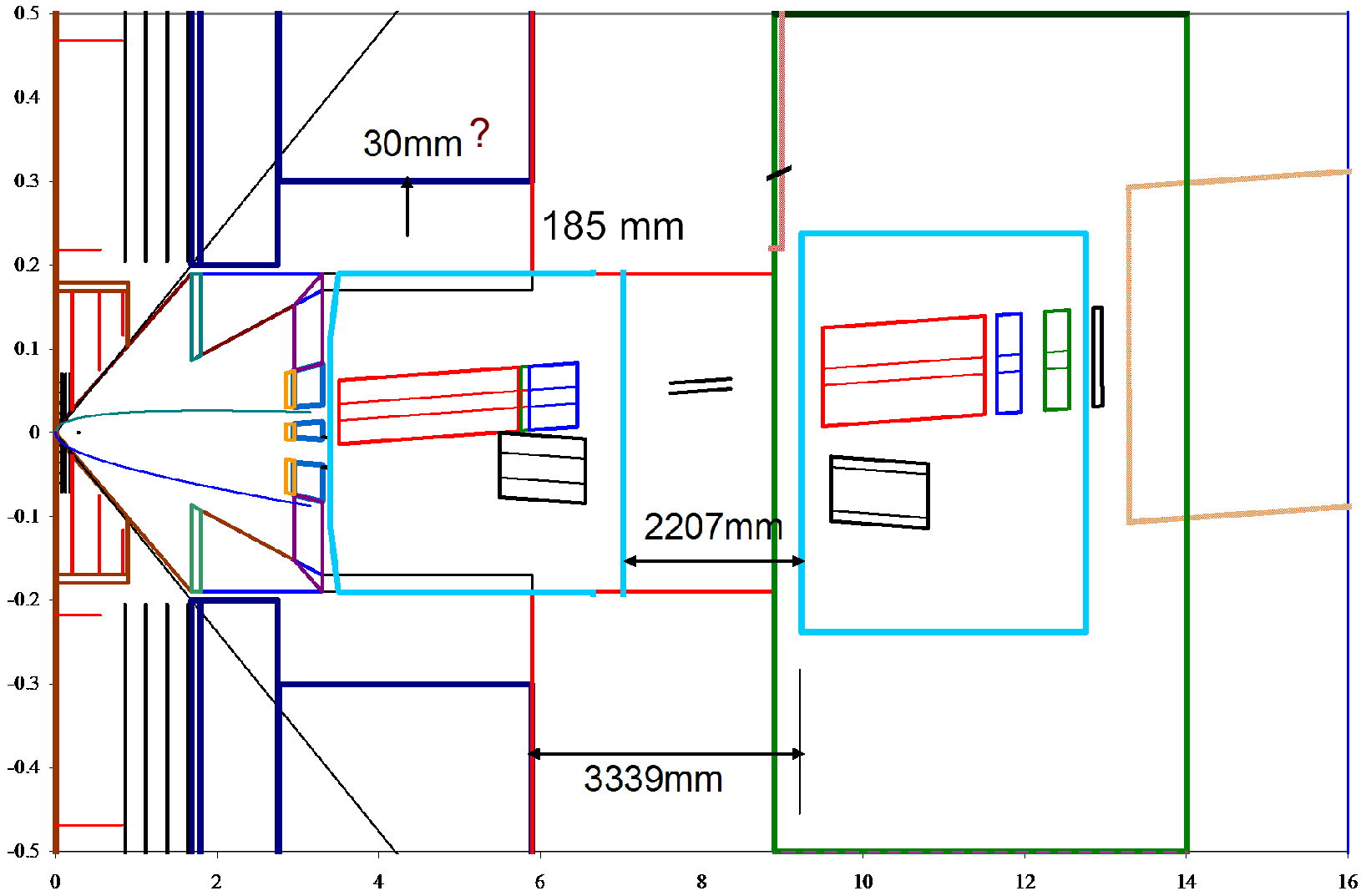
Two possible solutions: solution 2



Legend:

- pump
- BPM, strip-line
- kicker, strip-line
- bellows
- valve
- flanges

Location of FB hardware (SiD, L*=3.7m)

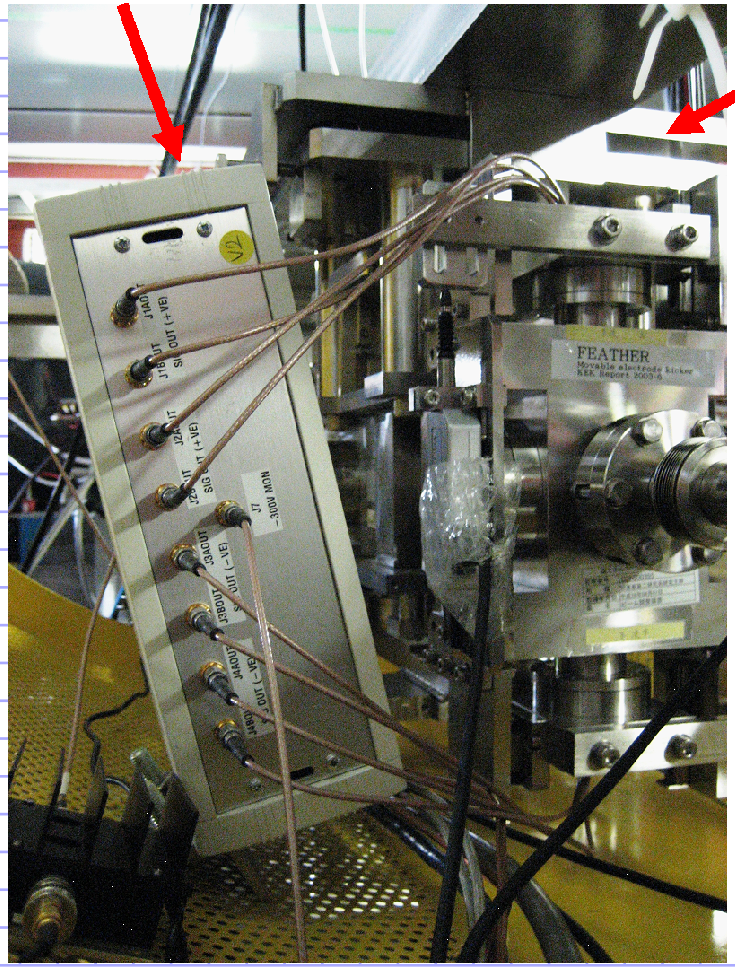


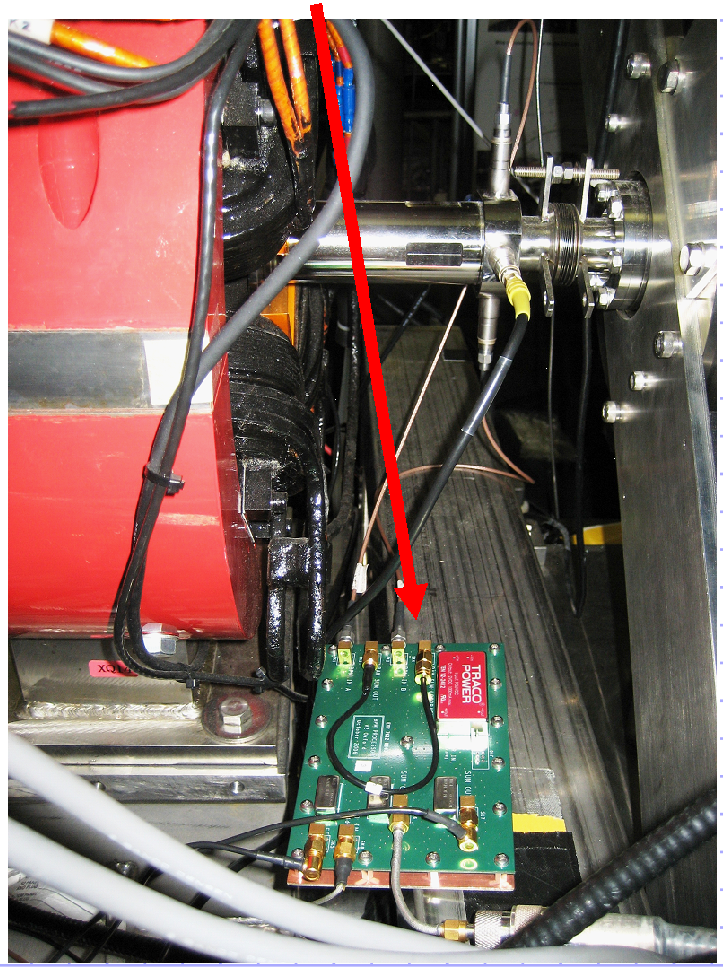
FONT4: beamline at KEK ATF (May 07)

Amplifier

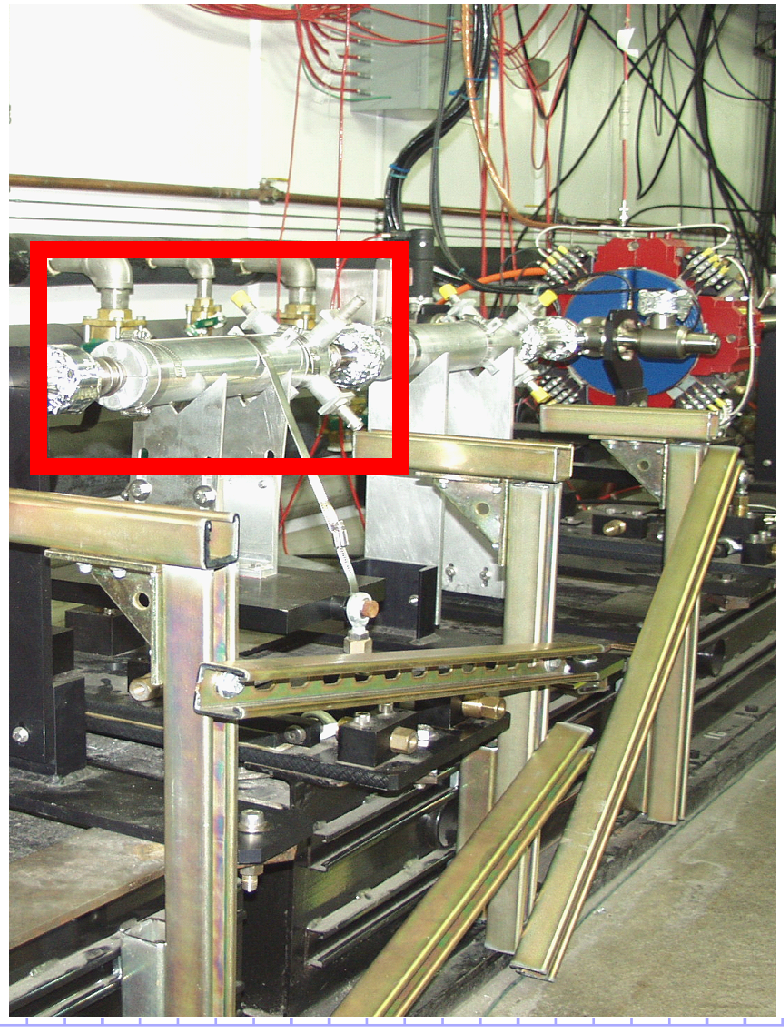
FEATHER
Kicker

BPM processor board



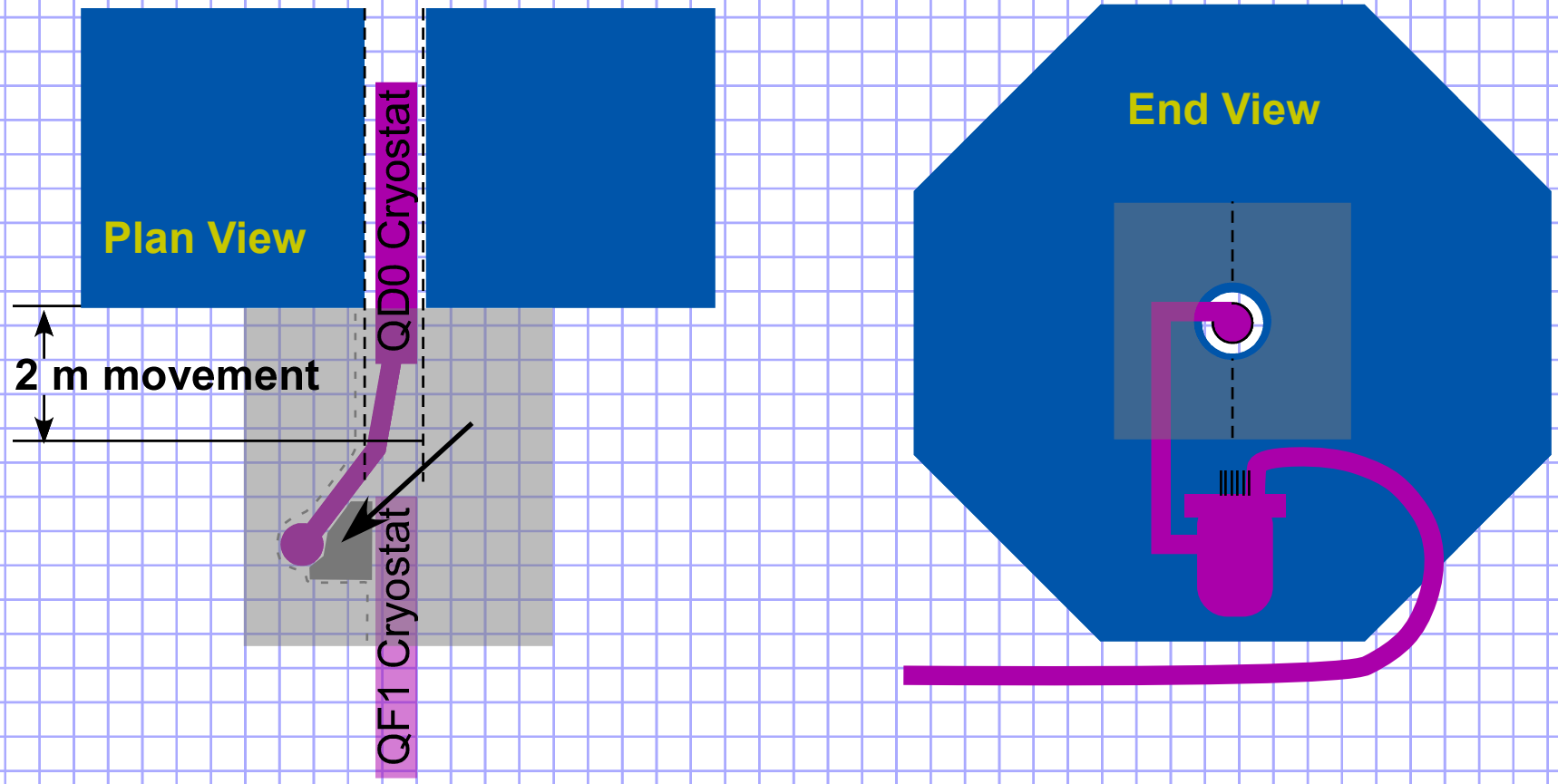


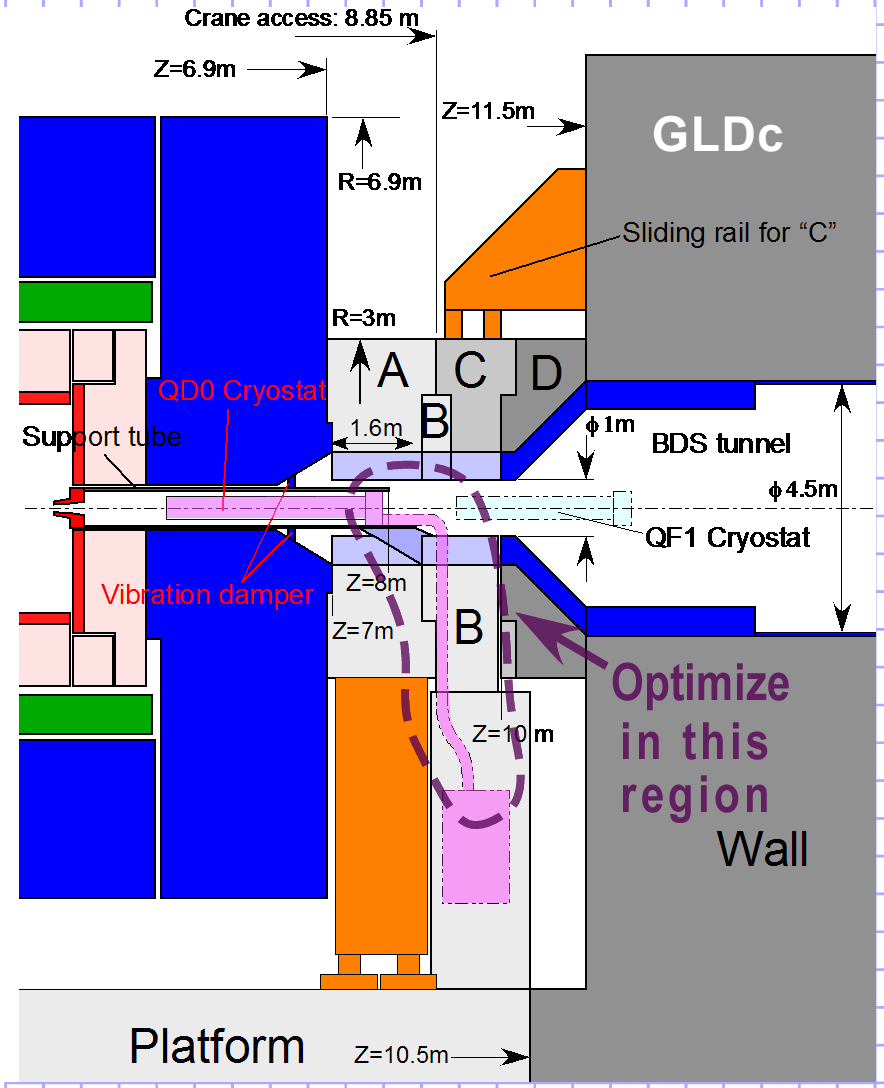
Kicker engineering issues

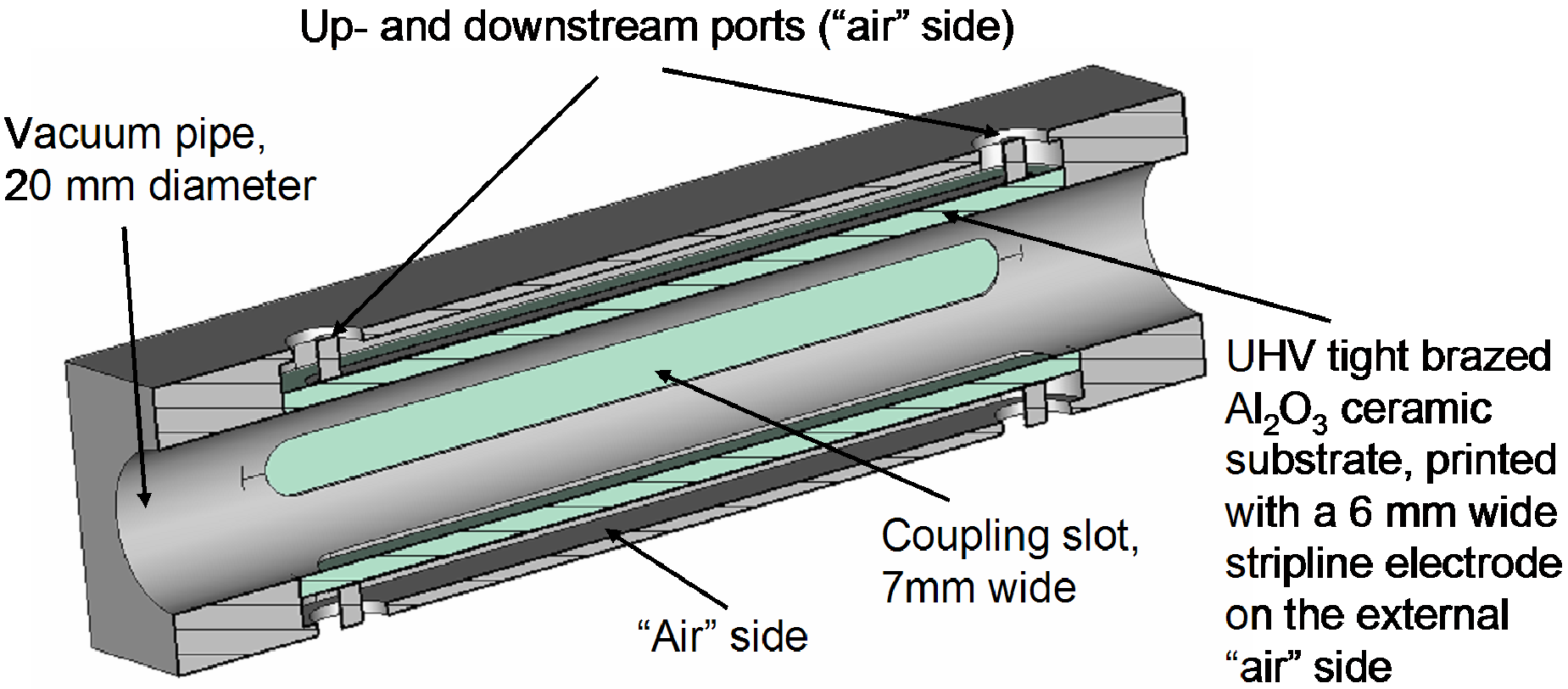


Real-estate more generous

- Does warm section move with detector in push-pull?
- Amplifier detector-side or machine-side of break?
- Flanges, bellows, at both ends?
- Shorten pickoffs?


Plan View
QD0 Cryostat
2 m movement
QF1 Cryostat
End View


Crane access: 8.85 m
Z=6.9m
Z=11.5m
R=6.9m
GLDc
Sliding rail for "C"
R=3m
A
C
D
B
QD0 Cryostat
Support tube
1.6m
ϕ1m
BDS tunnel
ϕ4.5m
QF1 Cryostat
Vibration damper
Z=8m
Z=7m
B
Optimize in this region
Wall
Z=10 m
Platform
Z=10.5m



- **Compact design, no UHV RF feedthroughs.**
- **Early design stage: no technical drawings, no final dimensions.**
- **Approximate space requirements:**
  150-200 mm length, 25-30 mm radial (for 20 mm dia. beam pipe)