



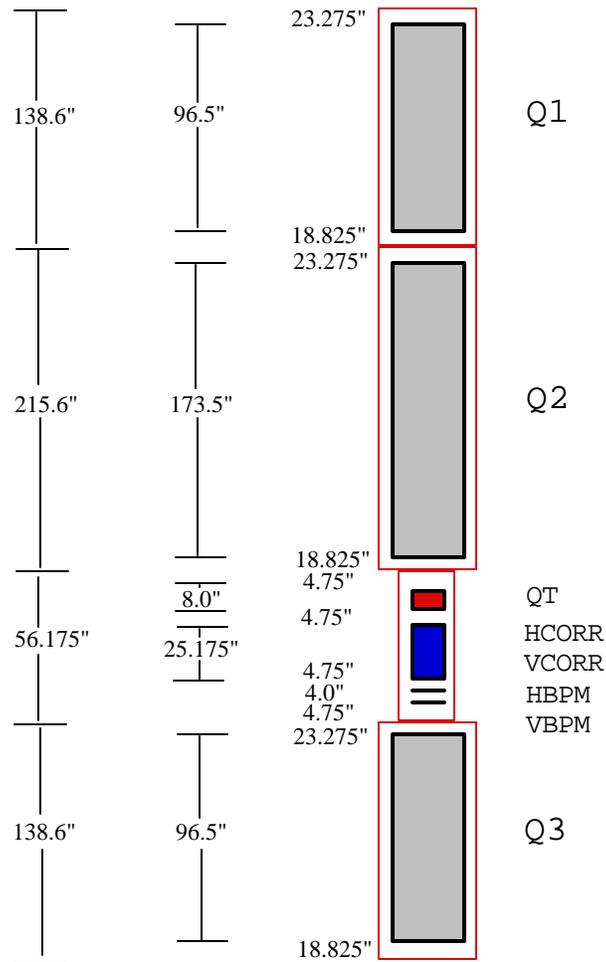
## IR MAGNETS

Quadrupoles sort into 3 gradient ranges:

- LHC-like magnets up to 170 T/m (limited by cryogenics).
- High-field quads @ 140 T/m (these are the Q1 magnets removed from B0 & D0 for Run II).
- Strong correction quads ~25 T·m/m ? analogous to the existing 38 T·m/m B0 & D0 spools.

Quad Location			Magnetic Length	Gradient (T/m)
Q1	B49a	C11a	96.5"	170
Q2	B49b	C11b	173.5"	170
QTT	B49	C11	8.0"	40
Q3	B49c	C11c	96.5"	170
Q4	B48	C12	75"	170
Q5	B47	C13	54"	170
Q6	B46	C14	55.19"	140
Q7	B45	C15	55.19"	140
QT8	B44	C16	25"	40
QT9	B43	C17	25"	40
QT0	B42	-	( 25" )	( 40 )
QTB	B38	-	( 25" )	( 40 )

## Triplets:



- Q1, Q2, & Q3 are powered in series (unlike the Tevatron) at  $\sim 10,000$  A.
- A special correction package, installed between Q2 & Q3, contains BPM's, dipole correctors & a trim quad QT :

At HCORR & VCORR  $\beta_x = \beta_y > 60\%$  of  $\beta_{max}$ , and both are almost exactly  $90^\circ$  from the IP;

Tuning quad QT (40 T/m) provides sufficient gradient variation at the triplet to complete the match to IP optics.

### **B48/C12 & B47/C13 170 T/m Magnets:**

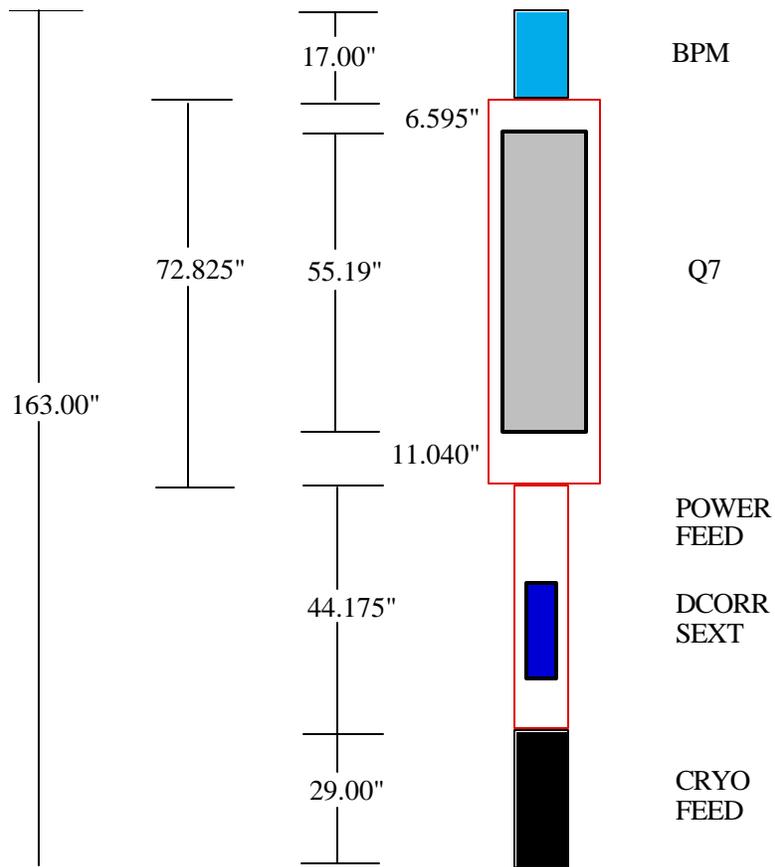
- Apart from their magnetic lengths the Q4 & Q5 magnets are imagined to have designs identical to the triplet quads ? the slot length being  $L_{\text{slot}} = L_{\text{mag}} + 1.06934 \text{ m}$ . [ The lop-sided allocation of space at each end of the cryostat (0.478 m one end, & 0.591 m the other) arises from keeping the quad's magnetic centers equidistant from the IP ].
- New, short (1.427 m), spools provide the magnet power feed & also contain a BPM plus correction elements.

### **B46/C14 140 T/m Magnets:**

- The Q6's are independently-powered, high-field, 55" magnets removed from Q1 locations at CDF & D0 for Run II.
- Spools identical to those at the Q4 & Q5 locations supply power.

### **B45/C15 140 T/m Magnets:**

- Q7's are also independently - powered, existing, 55" magnets from the Q1 sites at CDF & D0.
- New, short (1.122 m), spools provide the power feed to the magnets plus contain necessary correction elements.



- The short B45/C15 spool leaves adequate room for the Tevatron cryogenics feed.

### **B38 ? B44 & C16 ? C17 40 T/m Trims:**

- Six Trim spools contain 40 T/m 0.635 m quad correctors, plus sextupole & dipole correctors. [ No tuning is performed from the B39 (QTBA) location ].