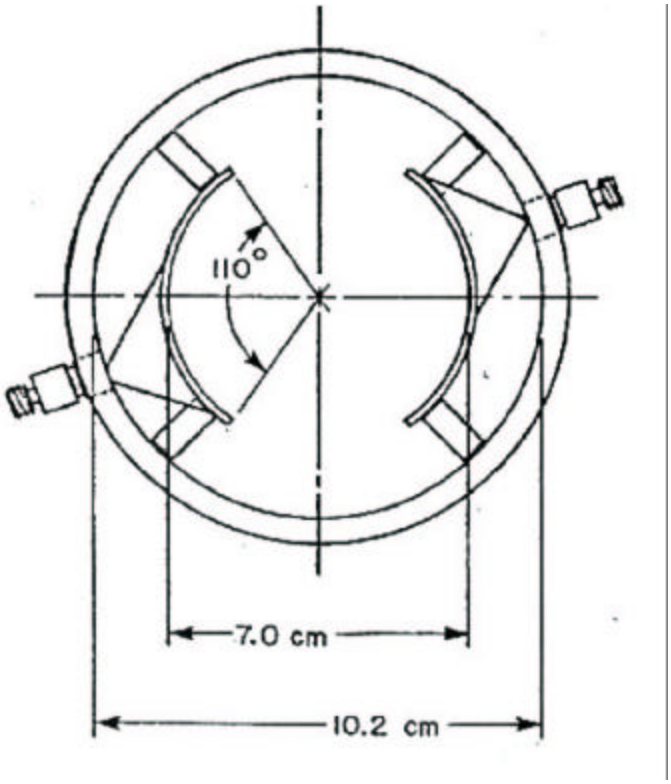
# Beam Position Monitors

## (a view from a spool)



# BPM's will be required in the X2 and X3 spools

| | *Magnetic Elements* | | | | | | | *Current Leads* | | *Interfaces* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Spool** | **Slot Length, m** | **VD T. m** | **HD T. m** | **SQ T.m/m** | **Sx T.m/m$^2$** | **Q* T.m/m** | **BPM** | **HTS Leads** | **Other Leads** | **UpStr comp.** | **UpStr intf.** | **UpStr bus** | **DnStrm comp.** | **DnStr intf.** | **DnStr bus** |
| **X1V** | 1.83 | 0.48 | | | 450 | 25 | | | 3x50A+SL | Quad | Tev | Tev | Dipole | Tev | Tev |
| **X1H** | 1.83 | | 0.48 | | 450 | 25 | | | 3x50A | Quad | Tev | Tev | Dipole | Tev | Tev |
| **X2L** | 1.43 | 0.48 | 0.48 | | | | **V&H** | 2x10kA | 2x50A+SL | **Q5** | Mod. Tev? | Tev, LHC | Dipole | Tev | Tev |
| **X2R** | 1.43 | 0.48 | 0.48 | | | | **V&H** | 2x10kA | 2 x50A | Cold bypass | Tev | Tev | **Q4** | Mod. Tev? | Tev, LHC |
| **X3** | 1.43 | 0.48 | 0.48 | 7.5 | | | **V&H** | 2x10kA | 3x50A+200A | **Q3** | New | LHC | **Q2** | New | LHC |
| **X3** | 1.43 | 0.48 | 0.48 | 7.5 | | | **V&H** | 2x10kA | 3x50A+200A | **Q2** | New | LHC | **Q3** | New | LHC |
| **X2R** | 1.43 | 0.48 | 0.48 | | | | **V&H** | 2x10kA | 2x50A | Dipole | Tev | Tev | **Q4** | Mod. Tev? | Tev, LHC |
| **X2L** | 1.43 | 0.48 | 0.48 | | | | **V&H** | 2x10kA | 2x50A+SL | **Q5** | Mod. Tev? | Tev, LHC | Dipole | Tev | Tev |
| **X1V** | 1.83 | 0.48 | | | 450 | 25 | | | 3x50A | Quad | Tev | Tev | Dipole | Tev | Tev |
| **X1H** | 1.83 | | 0.48 | | 450 | 25 | | | 3 x 50A+ SL | Quad | Tev | Tev | Dipole | Tev | Tev |

# BPM Information

## TD has a drawing from 1990 – "A.D.Low Beta Quad Q4 Magnet Return End Dual Beam Detector Assy" (2214-MD-276842)

Defines a length ( max 10in) along beam
Defines interface dimensions (O.D. of pipe ~4.25in; flange O.D. ~5.50in.)

## Some working assumptions (please challenge)

Dimensions (envelope) remain valid
AD will provide BPM assembly (section of pipe with striplines, feed thru's, etc.) ready for mounting
AD will specify details of cabling to outside world (connectors, impedance, length requirements, etc.)\

## Need requirements:

**Mounting/alignment mechanical tolerances**
relative to spool axis

**Offset measurements w/res. quadrupole axis**
what accuracy is required

**External survey reference**
transfer of BPM-quad data to external monuments

## “Technology transfer”

### 53MHz calibration system – once at MTF now somewhere in PPD ?

Learn system (no local experience remains)
Integrate with SSW ? (measurement of quadrupole magnetic axis)
Update system to meet new BPM requirements (Wolbers, Steimel, et al.)

## Develop contacts for BPM work

Stephen Pordes, (Asst. Div Head & Instrumentation Dept. Deputy Head)
Bob Webber, Instrumentation Dept Head
Stephen Wolbers (CD), & Jim Steimel (AD) – BPM Upgrade project

## Summary

Nominal space allocated in spools
Existing drawings 14 years old
Requirements needed
Measurement/alignment/calibration systems to be developed.