

## PXIE MEBT quadrupoles specifications

### *Beam parameters*

In the present optics configuration, PXIE MEBT requires 2 quadrupole doublets and 7 triplets to focus 5mA, 2.1 MeV CW H- beam.

Typical 3 sigma beam half-size  
in quadrupoles (X/Y)- 10/5 mm  
Shift of the un-chopped beam centroid - 4 mm

### *Main quadrupole parameters*

The total of 25 quadrupoles are proposed to be of two types, 11 quadrupoles of Type F and 14 of Type D (spares are not included). The quadrupoles should be removable without breaking vacuum for a possible bakeout, leak checks, and connecting BPM cables.

Minimum tip separation (diameter) - 34 mm

Integrated gradient homogeneity  
in the good field region 1%  
Region of the good field (diameter)- 23 mm

Maximum integrated gradient- 1.5 T for Type F  
0.85 T for Type D  
Suggested magnetic length- 10 cm for Type F  
5 cm for Type D

Separation between centers of quadrupoles  
in triplets (D+F+D)- 14.5 cm  
in doublets (F+F)- 17 cm  
(corresponds to the distance between iron of 7 cm in both cases)

### *Dipole correctors*

Each F quadrupole should include two (H and V) dipole correctors.

Integral of the dipole field- 2.1 mT\*m  
Region of the good field (diameter)- 23 mm  
Integrated field homogeneity  
in the good field region 5%

If this requirement is difficult to achieve, we can consider installation of sextupole correctors near one or two critical triplets and relax the requirement to 15% for the same aperture.

Space between quadrupoles is planned to be used for BPMs. The BPMs are supposed to be connected to cables before installation of quadrupoles. The space that should be left of winding and other quadrupole elements is shown on the following figure by brown dashed lines. All dimensions are in mm.

