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SINGLE PASS COLLIDER MEMO | CN- 172-R1

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TITLE: LINAC QUADRUPOLE CONNECTIONS

SLAC-CN--172-R1

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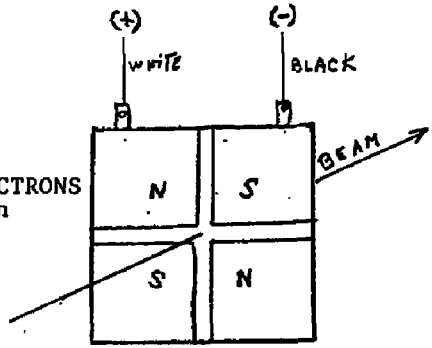
Linac type QC and QCH quadrupoles are mounted on the accelerator with their power connection side facing the injector. The connections are on the top of the magnet. The following picture describes a horizontally focusing quadrupole for electrons:

HF quadrupole for ELECTRONS with polarity shown

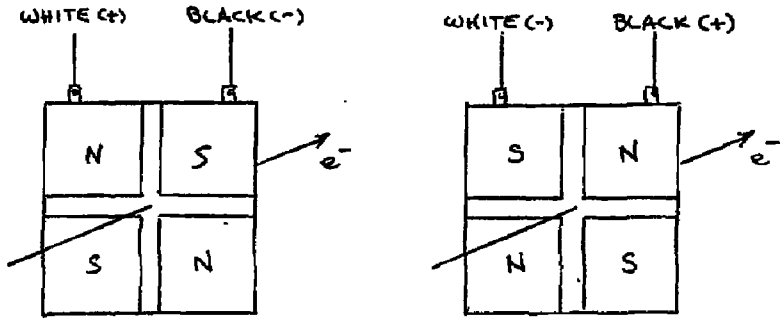


This is the correct polarity for magnets with a "+" sign before their strength given in the tables of CN-151.

The magnetic centers of all magnets are measured. If the magnetic center is above the geometric center, the distance δy is positive. If the magnetic center is to the right of the geometric center, the distance δx is positive. (To the right is in the direction of San Jose). Why?

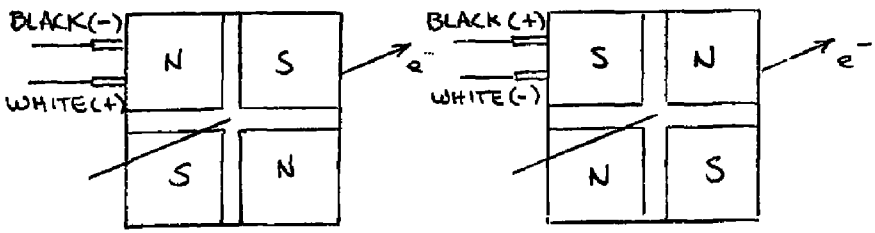
All quadrupoles have the white power lead attached to the San Francisco side and the black power lead attached to the San Jose side. Then, at the power supply in the alcove:

WHITE + BLACK - : HORIZONTAL FOCUS/ELECTRONS
WHITE - BLACK + : VERTICAL FOCUS/ELECTRONS



HF quadrupole for ELECTRONS HD quadrupole for ELECTRONS

Fig. 1. Sketch of power connections for type QC and QCH quadrupoles. The +/- signs at the terminals indicate the direction of current flow. The white/black color refers to the color of the insulation of the wire connecting the magnet to the power supply.



HF quadrupole for ELECTRONS HD quadrupole for ELECTRONS

Fig. 2. Sketch of power connections for type QW quadrupoles. The +/- signs at the terminals indicate the direction of current flow. The white/black color refers to the color of the insulation of the wire connecting the magnet to the power supply.

1. Type QC and QCH Quadrupoles. These magnets are mounted on the accelerator with the power connections on the west side (the side facing the injector). The connections are on the top of the magnet as shown in Fig. 1.

2. Type QW Quadrupoles. These magnets are mounted on the accelerator with the power connections on the west side. The connections are on the top-north edge of this face as shown in Fig. 2.

3. Polarity of Quadrupoles. A quadrupole that focuses electrons in the horizontal plane is an "F" quadrupole and has a "+" strength. Likewise a quadrupole that defocuses electrons in the horizontal plane is a "D" quadrupole and has a "-" strength.

4. Color Code. Regardless of the polarity of a quadrupole (F or D) the power lead of a given color (white or black) is always attached to the same geometric terminal as illustrated in the figures. Then at the power supply the connections are as follows:

Polarity of Quad	Color of Wire	Polarity of PS
HF	White	+
HF	Black	-
HD	White	-
HD	Black	+

5. Alignment Data Sign Conventions. When the magnetic center of a quad is above the geometric center, the distance dy is positive. When the magnetic center is to the south of the geometric center, the distance dx is reported by the precision alignment group as positive (whereas in the SLC convention this same distance would be negative).

6. Reference. Additional information can be found in the SLCHELP file under UNITS_AND_NAMES.