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Location of Sextupole Magnets

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The correction of the chromatic effects in the RHIC lattice is achieved with sextupoles at each arc quadrupole.[1,2] There are 25 quadrupole units per arc (23 arc quadrupoles + 1/2 Q9 + 1/2 Q9). However, in order to avoid half-length sextupoles, 24 sextupole units of equal length will be installed in each arc. One has therefore, several options for the location of the sextupoles. The following ground rules were applied to find a unique solution:

1. The 2 rings look identical with respect to its circulating beam.
2. The antisymmetry with respect to the crossing point is retained.
3. The sextupoles of inner and outer rings are at the same azimuthal location.
4. The 24 sextupoles within each arc are uniformly spaced.
5. The four Q9 quadrupoles at the injection area (6 o'clock) and consequently at 2 and 10 o'clock remain without sextupoles.
6. The dipole correctors at the Q9 quadrupoles in the 2, 6, and 10 o'clock insertions are on the arc side, thereby locating all correctors and sextupoles in the entire arc.

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1. G. Parzen, "Correction of chromatic effects in the β-functions in RHIC", RHIC-AP-28 (1986).

2. S. Y. Lee, "Chromatic correction for the RHIC lattice", RHIC-17 (1986).