

Beam Based Alignment of C-Shaped Quadrupole Magnets*, G. PORTMANN, D. ROBIN LBL - Many storage rings have implemented a method of finding the positional offset between the electrical center of the beam position monitors (BPM) and the magnetic center of the adjacent quadrupole magnets. The algorithm for accomplishing this is usually based on modulating the current in the quadrupole magnet and finding the beam position that minimizes the orbit perturbation. When the quadrupole magnet is C-shaped, as it is for many light sources, the modulation method can produce an erroneous measurement of the magnetic center in the horizontal plane. When the current in a C-shaped quadrupole is changed, there is an additional dipole component in the vertical field. Due to the hysteresis effects of the C-magnet geometry, the beam based alignment technique at the Advanced Light Source (ALS) deviated horizontally by 400 micrometers from the actual center. By modifying the technique, the offsets were measured to an accuracy of better than 50 micrometers.

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