Contribution ID: **1815** Contribution code: **THPA038** Type: **Poster Presentation**

Beam-based alignment of individual members of sextupole families

Thursday 11 May 2023 16:30 (2 hours)

In order to steer beams through the center of focusing elements, the field center with respect to adjacent Beam Position Monitors needs to be known precisely. Often individual qudrupoles are varied to find the center, where the orbit does not change, but this requires costly field control for each quadrupole. Here we analyze beam-based Alignment(BBA) techniques that utilizes sextupoles that are powered in smaller families. These methods usually involve altering the strength of a sextupole to find the center, where the tunes do not change. However, these approaches do not hold up well for sextupoles powered in families, as changing the strength of one sextupole in a family also changes the strength of every other family member. To reduce the effects of other sextupoles in the same family, a new method was developed and investigated that involves creating a closed three-kicker-bump around a sextupole and observing the effects of the sextupole field on the kick settings. By changing the position at which the beam enters the sextupole by controlling the bump amplitude, one can reconstruct the sextupole center. Here, we explore the precision to which this method can reconstruct the sextupole center and we derive an error equation used to explain the degree of precision expected from this method.
1

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Author: WANG, James (Cornell University (CLASSE))

Co-authors: HOFFSTAETTER, Georg (Cornell University (CLASSE)); SAGAN, David (Cornell University (CLASSE))

Presenter: SAGAN, David (Cornell University (CLASSE))

Session Classification: Thursday Poster Session

Track Classification: MC6: Beam Instrumentation, Controls, Feedback and Operational Aspects: MC6.T17: Alignment and Survey