



Abstract ID : 1175

Recent developments in the study of beam size using sextupole magnets

Content

Our prior contributions to IPAC conferences have presented the derivation of the calculations of beam size which can be obtained from measurements of phase and orbit differences when a sextupole strength is varied, and extended the analysis to two dimensions to include changes in the coupling function around the ring. We have described analysis methods which exploit the precision of polynomial fits to these difference functions and studied contributions to statistical and systematic uncertainties. We have applied measurements of sextupole misalignments and calibration factors at the Cornell Electron/positron Storage Ring to this effort, and discussed the contributions to the uncertainties in these as well. Here we address a recent discovery that the calculated beam size is more accurate for larger variations in sextupole strength. We address this conundrum with further data analysis and modeling based on the capabilities provided by the Bmad toolkit.

Region represented

North America

Footnotes

Funding Agency

Work supported by NSF award DMR-1829070, NIH/NIGMS award 1-P30-GM124166-01A1, AFRL award FA8650-22-2-5200, and DOE DE-SC0012704.

Paper preparation format

LaTeX

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Track Classification: MC2.A05 - MC2.A05 Synchrotron Radiation Facilities

Contribution Type: Poster Presentation

Submitted by **CRITTENDEN, James** on **Sunday, December 10, 2023**