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EPU coupling correction by Bayesian optimization

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APPLE-II type elliptically polarized undulators (EPUs) are widely used in synchrotron light sources to produce elliptically polarized light. However, manufacturing imperfections in EPUs can introduce a skew quadrupole component that varies with different gap and phase settings. This skew quadrupole component couples horizontal betatron motion and dispersion into the vertical plane, increasing the beam size and degrading beam quality. To address these coupling issues, EPUs are typically equipped with skew quadrupole magnets to compensate for the residual skew quadrupole component. This paper presents a method based on Bayesian optimization to generate a 2D coupling feed-forward table for coupling correction.

Footnotes

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