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Nonlinear optics from hybrid dispersive orbits

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We expanded the capability of the nonlinear optics from off-energy closed orbits technique proposed by Olsson et al. to include harmonic sextupole correction in storage rings. The existing technique was successfully used to correct the errors of chromatic sextupoles on the MAX-IV machine. However, it was not applicable to harmonic sextupoles, which are widely used in 3^{rd}-generation light sources, and even some 4^{th}-generation diffraction-limited machines. By introducing vertically dispersive orbits with skew quadrupoles, we were able to observe a measurable dependency on harmonic sextupoles. We used both simulations and beam measurements at the National Synchrotron Light Source II storage ring to demonstrate the expanded capability of our technique.

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Footnotes

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