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Ellipticity-Resolved High-Harmonic Spectroscopy of Phase-Locked Attosecond Pulse Trains

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We develop and explore, theoretically and experimentally, a high harmonic spectroscopy technique for the interlocking of attosecond pulse trains (APTs). We produce a pair of intertwined APTs by driving HHG with cross-linear ω-2ω fields and then modify their properties by introducing slight ellipticities to the drivers. Most importantly, we developed an analytic formula that maps very well the properties of the APT pair to the ellipticities of the high harmonics (which vary from linear to nearly circular). We utilize this mapping for recovering APTs properties (attosecond relative delay, relative polarization angle and APT ellipticities) by measuring the ellipticities of the high harmonics vs. the pump ellipticity.

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