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Simple few-shot method for spectrally resolving the wavefront of an ultrashort laser pulse

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We present a novel and straightforward approach for the spatio-spectral characterization of ultrashort pulses: IMPALA (iterative multispectral phase retrieval for lasers) {1}. This minimally intrusive method relies on placing a mask with specially arranged pinholes in the beam path before the focusing optic and retrieving the spectrally-resolved laser wavefront from the speckle pattern produced at focus. We test the efficacy of this new method by accurately retrieving chromatic aberrations, such as pulse front tilt, pulse front curvature, and higher-order aberrations introduced by a spherical lens. The simplicity and scalability of this method, combined with its compatibility with single-shot operation, make it a promising candidate to become a new standard diagnostic tool in high-intensity laser facilities.

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References:

{1} S. Smartsev et. al. arXiv:2307.15799

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Classification de Session: Simulations électrons

Classification de thématique: Installations