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Application of Wigner transform for characterization of aberrated laser beams

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Keywords

laser beams, laser optics, beam quality, Wigner transform, aberrations

Abstract

The slit scan method was implemented for registration of intensity profiles along the caustics of a laser beam. The inverse Radon transform of spatially normalized intensity profiles enables direct computation of Wigner transform of real laser beam. The Rayleigh range, divergence angle, beam quality factor, global degree of coherence can be determined in such a simple way. A procedure enabling derivation of the shape of aberrated wavefornt and spherical aberration content was elaborated. This method was applied for investigation of the aberrated laser beams generated by cw and pulsed diode pumped lasers.

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