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## P4.050 Polarimetric laser beam diffraction in tokamak plasma

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In this paper the method of complex geometrical optics (CGO) is applied to the analysis of polarimetric laser beam propagation and diffraction in tokamak plasma. The paraxial CGO reduces the problem of beam diffraction in inhomogeneous medium to the set of ordinary differential equations, which significantly simplifies calculation as compared with full-wave approach. Numerical simulations for Gaussian beam, propagating in the poloidal plane of the inhomogeneous thermonuclear plasma, reveal differences in beam width and phase front curvature evolution in comparison with homogeneous media. Such additional distortion of the beam must be taken into account in polarimetric system modelling. The presented approach may also be applied in other measurement techniques that use electromagnetic beams, like interferometry or refractometry - with limitations discussed in the text.

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