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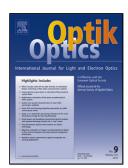
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Polarization properties of Square Multi-Gaussian Schell-Model beam propagating

through non-Kolmogorov turbulence

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Abstract: In this paper, analytical expressions for elements of the cross-spectral density

matrix of Square Multi-Gaussian Schell-Model (SMGSM) beam, propagating in

non-Kolmogorov turbulence, are derived based on the extended Huygens Fresnel integral.

Polarization properties of the SMGSM beam are studied in detail based on the derived

expressions. It is interesting to find that, apart from keeping the square flat shape of

intensity distribution, polarization properties of the SMGSM beam, such as degree of

polarization, the orientation angle and degree of ellipticity for the polarization ellipse also

form square plateau distributions in the same areas as that of intensity distribution, and can

preserve relatively long distance in atmospheric turbulence. This novel characteristic can

be used for coherent light free space communications, polarization remote sensing and

imaging in atmosphere.

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