

Non Classical Photonic Nanojets in near Field of Metallic and Negative-Index Scatterers, Purely Electric and Magnetic Nanojets

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Abstract : We present the results of our analytical and computational study of Laguerre-Gaussian (LG) beams scattering by spherical homogeneous isotropic particles located on the axis of the beam. We consider different types of scatterers (dielectric, metallic and double negative metamaterials) and different polarizations of the LG beams. A possibility to generate photonic nanojets using metallic and double negative metamaterial Mie scatterers is shown. We have studied the properties of such nonclassical nanojets and discovered new types of the nanojets characterized by zero on-axes magnetic (or electric) field with the electric (or magnetic) field polarized along the z-axis.

Keywords : double negative metamaterial, Laguerre-Gaussian beam, Mie scattering, optical vortices, photonic nanojets

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