Abstract Submitted
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Mapping of focused Laguerre-Gauss beams JOSE R. RIOS LEITE, Departamento de Física, Universidade Federal de Pernambuco, 50670-901 Recife, PE, Brazil, VASILY KLIMOV, P.N. Lebedev Physical Institute, Russian Academy of Sciences, 53 Leninsky Prospekt, Moscow 119991, Russia, MARTIAL DUCLOY, DANIEL BLOCH, Laboratoire de Physique des Lasers, Universite Paris 13, Sorbonne Paris-Cite and CNRS, UMR 7538, 99 Ave. J.B. Clement, F-93430, BRAZIL-FRANCE CAPES456/04-COFECUBPH740/12 COLLABORATION, ("P.I.C.S." NO. 5813) BETWEEN C.N.R.S. AND THE RUSSIAN FOUNDATION FOR BASIC RESEARCH COLLABORATION — We study the detection of propagating optical fields bearing axial symmetry in the situation of an extreme focusing, when the paraxial approximation no longer holds. The results, obtained by general arguments based upon the vectorial nature of electromagnetic fields, show the rapid spatial variations of fields with "complicated" spatial structure [1]. Laguerre-Gauss beam, notably beams bearing a l = 2 orbital angular momentum for which a magnetic field and a gradient of the electric field are present on axis have been examined in their behavior upon an atomic size light detector sensitive to quadrupole electric transitions as well as to magnetic dipole transitions. nd apply it to the case of a Laguerre-Gauss beam.We detail how the mapping of such a beam depends on the nature and on the specific orientation of the detector. We also show that the interplay of mixing of polarization and topological charge, respectively associated to spin and orbital momentum when the paraxial polarization holds, modifies the apparent size of the beam in the focal plane.
[1]. V. Klimov, M. Ducloy, D. Bloch and JR Rios Leite, Phys. Rev. A 85, 053834 (2012).

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