

# Factorization method, radial oscillators and Laguerre-Gaussian modes

Sara Cruz y Cruz<sup>1,\*</sup> and Zulema Gress<sup>1</sup>

<sup>1</sup>SEPI-UPIITA, Instituto Politécnico Nacional, Av. IPN No. 2580,  
Col. La Laguna Ticomán, C.P. 07340 México DF, Mexico

The factorization method is applied in the solution of the paraxial Helmholtz equation in order to construct the Laguerre-Gaussian modes by means of the corresponding operator algebra. The paraxial optics analog of some families of coherent states are also presented.

---

\* [sgcruz@ipn.mx](mailto:sgcruz@ipn.mx)