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The electron in three-dimensional momentum space

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We study the electron at order alpha as a system composed by an electron and a photon within the framework of light-front quantization. We derive the leading-twist transverse-momentum dependent distribution functions for both the electron and photon in the dressed electron, using different gauge prescriptions. In particular, we discuss the light-cone gauge and the Feynman gauge, applying both the formalism of light-front wave function overlap representation and the diagrammatic approach. Furthermore, we present a detailed discussion of the role of the Wilson lines to obtain gauge-independent results.

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