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Parametrization of the Transition Amplitude and the Triply-Differential Cross Section for Two-Photon Double Ionization[1] E.A. PRONIN, ANDREI Y. ISTOMIN, ANTHONY F. STARACE, University of Nebraska-Lincoln, N.L. MANAKOV, S.I. MARMO, Voronezh State University, Russia — We present model-independent representations for the transition amplitude and the triply-differential cross section for two-photon double ionization (TPDI) of He, in which the kinematical and dynamical parameters of the process are separated. For the case of DPI by two photons having different polarizations, the transition amplitude is parametrized by *five* polarization-independent amplitudes, which can be expressed in terms of exact two-electron radial matrix elements. For the case of TPDI by two identical photons, only *four* amplitudes are necessary. For this latter case we analyze photon polarization effects and predict the existence of both circular dichroism (CD) and elliptic dichroism (ED) effects in TPDI electron angular distributions. This contrasts with single-photon double ionization, in which only the CD effect exists. We also analyze the dynamics of the TPDI process within the lowest-order perturbation theory in the interelectron interaction and estimate the magnitudes of these effects.

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