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Spin correlations of the final leptons in the two-photon processes gamma gamma -> e+e-, mu+mu-, tau+ tau-

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The spin structure of the two-photon process gamma gamma –> e+ e- is theoretically investigated. It is shown that if the primary photons are unpolarized the final electron and
positron are unpolarized as well but their spins are strongly correlated. Explicit expressions for the components of the correlation tensor of the final e+e- system are derived
and the relative fractions of singlet and triplet states of the e+e- pair are found. It is demonstrated that in the process gamma gamma –> e+e- one of the incoherence inequalities of the Bell type for the correlation tensor components is always violated and thus spin correlations of the electron and positron in this process have the strongly pronounced quantum character. Analogous consideration can be wholly applied as well to the two-photon processes gamma gamma –>mu+mu- and gamma gamma –>tau+tau- which become possible at considerably higher energies

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