Quantum Physics

Magnetic Moment Coupling to Circularly Polarized Photons

O. V. Kibis

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Exact stationary solutions of the wave equation are obtained to describe the interaction between magnetic moment of elementary particle and circularly polarized photons. The obtained solutions substantially modify the conventional model of field-matter interaction. It follows from them that magnetic moment couples to photons, and this coupling leads to bound particle-photon states with different energies for different orientations of magnetic moment. As a consequence, the interaction splits particle states differing by directions of total angular momentum. Stationary spin splitting, induced by photons, and concomitant effects can be observed for particles exposed to a laser-generated circularly polarized electromagnetic wave.

Comments:	4 pages, 1 figure; Discussion of results is slightly expanded
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