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Motion of a charged particle in the field of a circularly polarized amplitude-modulated electromagnetic wave in the presence of a constant magnetic field. (English. Russian original)

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Summary: An analysis of the problem of motion of a charged particle in the field of a circularly polarized amplitude-modulated electromagnetic plane wave in the presence of a constant homogeneous magnetic field is presented. Formulas are obtained for the average kinetic energy of the particle. The dependence of the average kinetic energy on the intensity of the electromagnetic wave is derived.

MSC:

78A35 Motion of charged particles

78A40 Waves and radiation in optics and electromagnetic theory

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electromagnetic plane wave; modulation frequency; average kinetic energy

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References:

- [1] Galkin, AL; Romanovsky, MY; Shiryaev, OB; et al., No article title, Phys. Plasmas, 15, 023104, (2008) · doi:10.1063/1.2839349
- [2] Galkin, AL; Egorov, VA; Kalashnikov, MP; et al., No article title, Contrib. Plasma Phys., 49, 544, (2009) · doi:10.1002/ctpp.200910054
- [3] Gaponov, AV; Miller, MA, No article title, Zh. Eksp. Teor. Fiz., 34, 242-243, (1958)
- [4] Bitjuk, DR; Fedorov, MV, No article title, Zh. Eksp. Teor. Fiz., 116, 146-148, (1999)
- [5] Galkin, AL; Korobkin, VV; Romanovsky, MY; Shiryaev, OB, No article title, Zh. Eksp. Teor. Fiz., 127, 1195-1207, (2005)
- [6] Bagrov, VG; Bordovitsyn, VA, No article title, Zh. Vychisl. Mat. Mat. Fiz., 8, 691-695, (1968)
- [7] Bagrov, VG; Gitman, DM; Lavrov, PM, No article title, Russ. Phys. J., 17, 808-811, (1974)
- [8] L. D. Landau and E. M. Lifshitz, The Classical Theory of Fields, Vol. 2, Butterworth-Heinemann, London (1975). · Zbl 0178.28704
- [9] Roberts, CS; Buchsbaum, SJ, No article title, Phys. Rev., 135, a381, (1964) · doi:10.1103/PhysRev.135.A381
- [10] V. G. Bagrov, D. M. Gitman, I. M. Ternov, \textit{et al.}, Exact Solution of Relativistic Wave Equations [in Russian], Nauka, Novosibirsk (1982).
- [11] V. G. Bagrov, G. S. Bisnovaty-Kogan, V. A. Bordovitsyn, \textit{et al.}, Theory of Emission by Relativistic Particles [in Russian], Fizmatlit, Moscow (2002).
- [12] Kopytov, GF; Tlyachev, VB; Oksuzyan, SS, No article title, Izv. Vyssh. Uchebn. Zaved. Fiz., 28, 110-111, (1986)
- [13] G. F. Kopytov, S. S. Oksuzyan, and V. B. Tlyachev, Paper deposited at VINITI, No. 7353-87, Moscow (September 14, 1985).
- [14] Kopytov, GF; Martynov, AA; Akintsov, NS, No article title, Ekolog. Vestn. Nauchn. Tsentr. Chernomorsk. Ekonomich. Sotrudn., 2, 39-43, (2014)
- [15] Milan't'ev, VP, No article title, Usp. Fiz. Nauk, 167, 3-16, (1997) · doi:10.3367/UFNr.0167.199701a.0003
- [16] Milan't'ev, VP, No article title, Usp. Fiz. Nauk, 183, 875-884, (2013) · doi:10.3367/UFNr.0183.201308f.0875
- [17] Bessonov, EG, Trudy fizich. Inst. Imeni P. N. Lebedeva, 214, 3-101, (1993)
- [18] G. S. Landsberg, Optics [in Russian], Fizmatlit, Moscow (2003).
- [19] G. F. Kopytov and V. B. Tlyachev, Paper deposited at VINITI, No. 6526-84, Moscow (October 11, 1984).
- [20] R. G. Newton, Scattering Theory of Waves and Particles, Dover Publications, Mineola, New York (2013).
- [21] R. M. A. Azzam and N. M. Bashara, Ellipsometry and Polarized Light, North-Holland Personal Library, Amsterdam (1988).
- [22] Andreev, SN; Makarov, VP; Rukhadze, AA, No article title, Kvant. Elektron., 39, 68-72, (2009) · doi:10.1070/QE2009v039n01ABEH013968

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