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Scattering asymptotics for a charged particle coupled to the Maxwell field. (English)

Zbl 1316.78002

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Summary: We establish long time soliton asymptotics for the nonlinear system of Maxwell equations coupled to a charged particle. The coupled system has a six-dimensional manifold of soliton solutions. We show that in the long time approximation, any solution, with an initial state close to the solitary manifold, is a sum of a soliton and a dispersive wave which is a solution of the free Maxwell equations. It is assumed that the charge density satisfies the Wiener condition. The proof further develops the general strategy based on the symplectic projection in Hilbert space onto the solitary manifold, modulation equations for the parameters of the projection, and decay of the transversal component.

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MSC:

- 78A35 Motion of charged particles
- 78A60 Lasers, masers, optical bistability, nonlinear optics
- 35C08 Soliton solutions
- 78A40 Waves and radiation in optics and electromagnetic theory
- 28C20 Set functions and measures and integrals in infinite-dimensional spaces (Wiener measure, Gaussian measure, etc.)

Cited in 10 Documents

Full Text: [DOI](#) [arXiv](#) [Link](#)

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