Foundations of Physics 2001 vol.31 N7, pages 1039-1049

Relativistic Dynamics of Vector Bosons in the Field of Gravitational Radiation

Balakin A., Kurbanova V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

We consider a model of the state evolution of relativistic vector bosons, which includes both the dynamical equations for the particle four-velocity and the equations for the polarization four-vector evolution in the field of a nonlinear plane gravitational wave. In addition to the gravitational minimal coupling, tidal forces linear in curvature tensor are suggested to drive the particle state evolution. The exact solutions of the evolutionary equations are obtained. Birefringence and tidal deviations from the geodesic motion are discussed.

http://dx.doi.org/10.1023/A:1017522206384