

Hamiltonian Approach to the Problem of Tunneling of Relativistic Particles

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Abstract—The Hamiltonian approach to the problem of tunneling of relativistic particles has been developed. The method is described by applying it to a specific example, the theory of the ionization of a relativistic bound state (whose binding energy is comparable with the electron rest energy mc^2) under the effect of external electric and magnetic fields. It has been shown that the Hamiltonian approach makes it possible to obtain an explicit expression for both exponential and preexponential factors in the ionization probability.