

The Barut Second-Order Equation: Lagrangian, Dynamical Invariants and Interactions

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Abstract. The second-order equation in the $(1/2, 0) \oplus (0, 1/2)$ representation of the Lorentz group has been proposed by A. Barut in the 70s, ref. [1]. It permits to explain the mass splitting of leptons (e, μ, τ) . Recently, the interest has grown to this model (see, for instance, the papers by S. Kruglov [2] and J. P. Vigié *et al.* [3]). We continue the research deriving the equation from the first principles, finding dynamical invariants for this model, investigating the influence of potential interactions.

Keywords. Barut, electron, Lorentz group, dynamical invariants.

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