

Abstract

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Dirac Particles Interacting Directly in 1+3 Dimensions

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We investigate existence and uniqueness of a class of integral equations that implement direct interaction, rather than interaction via potentials or a mediating field, between two Dirac particles. This class of equations arises naturally as a relativistic generalisation of the two particle Schrödinger equation. In implementing a delayed interaction these integral equations rely crucially on using a multi-time wavefunction. While introducing interaction we avoid ultraviolet divergences as well as breaking Lorentz symmetry.