

Abstract Submitted
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Elastic Rotational Solitons as Elementary Particles ROBERT CLOSE, Clark College — By assuming a linear response to variations of orientation in an ideal isotropic elastic solid, we derive a nonlinear Dirac equation which describes rotational waves. This result provides a simple mechanical interpretation of relativistic quantum mechanical dynamics. The energy, momentum, and angular momentum operators are derived. Fermion and boson solutions may both be possible. Correlations between states have the quantum mechanical form. Half-integer spin arises from the fact that waves propagating in opposite directions form independent states 180 degrees apart. The Pauli exclusion principle and interaction potentials are derived from the assumption of independent interacting soliton “particles.”

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