Universidad de Valladolid

Q-CAYLE COMUNICACIONES CUÁNTICAS

A distributional approach to point interactions in relativistic quantum mechanics

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Abstract: We discuss an approach based on Schwartz's distribution theory to treat point interactions in one-dimensional quantum mechanics, focusing on the relativistic case (i.e., Dirac Equation). We obtain the most general distribution describing relativistic point interactions and show that it allows us to establish a relationship between the parameters describing the matching conditions across the singular points and parameters describing scalar, pseudo-scalar, and vector point potentials. Some preliminary results for the Dirac equation with double point interactions and well-defined parity are also discussed.

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