



Universidad de Valladolid



Point interactions in 1D relativistic quantum mechanics: physical parameters and symmetries

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Abstract: Apart from the applications in several models, point interactions in one dimension also serve as a theoretical laboratory to investigate properties of some methods of regularisation and/or renormalisation, which are ubiquitous in quantum field theory, in simpler models in quantum mechanics. Point potentials are described by singular distributions, like the Dirac delta distribution or its derivatives, and products involving distributions are not universally defined in the (Schwarz's) theory of distributions. Recently, we proposed an alternative and also mathematical consistent approach, based on Schwarz's theory of distributions, to deal with this problem. This distributional approach seems to be more physically appealing, and it results in the same family of admissible interactions obtained from SAE, with the advantage of specifying the details of the interaction as a distribution concentrated at the singular points.



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