

## Mathematical Physics

# Wigner quantization of some one-dimensional Hamiltonians

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*(Submitted on 10 Nov 2010)*

Recently, several papers have been dedicated to the Wigner quantization of different Hamiltonians. In these examples, many interesting mathematical and physical properties have been shown. Among those we have the ubiquitous relation with Lie superalgebras and their representations. In this paper, we study two one-dimensional Hamiltonians for which the Wigner quantization is related with the orthosymplectic Lie superalgebra  $osp(1|2)$ . One of them, the Hamiltonian  $H = xp$ , is popular due to its connection with the Riemann zeros, discovered by Berry and Keating on the one hand and Connes on the other. The Hamiltonian of the free particle,  $H_f = p^2/2$ , is the second Hamiltonian we will examine. Wigner quantization introduces an extra representation parameter for both of these Hamiltonians. Canonical quantization is recovered by restricting to a specific representation of the Lie superalgebra  $osp(1|2)$ .

Subjects: **Mathematical Physics (math-ph)**; Quantum Physics (quant-ph)

MSC classes: 81Q10, 81Q65, 33C45

Cite as: **arXiv:1011.2305v1 [math-ph]**

## Submission history

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