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Wigner functions and Weyl operators on the Euclidean motion group. (English)

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Summary: The Wigner distribution function is one of the pillars of the phase space formulation of quantum mechanics. Its original formulation may be cast in terms of the unitary representations of the Weyl-Heisenberg group. Following the construction proposed by Wolf and coworkers in constructing the Wigner functions for general Lie groups using the irreducible unitary representations of the groups, we develop here the Wigner functions and Weyl operators on the Euclidean motion group of rank three. We give complete derivations and proofs of their important properties.

MSC:

81S30 Phase-space methods including Wigner distributions, etc. applied to problems in quantum mechanics

Cited in 1 Document

20C35 Applications of group representations to physics and other areas of science

22E70 Applications of Lie groups to the sciences; explicit representations

81R05 Finite-dimensional groups and algebras motivated by physics and their representations

Keywords:

Euclidean motion group; unitary representations; Wigner function

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