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Generalized Heisenberg algebra applied to realizations of the orthogonal, Lorentz, and Poincaré algebras and their dual extensions. (English) [Zbl 1443.81044](#)
J. Math. Phys. 61, No. 5, 051705, 13 p. (2020).

Summary: We introduce the generalized Heisenberg algebra \mathcal{H}_n and construct realizations of the orthogonal and Lorentz algebras by a formal power series in a semicompletion of \mathcal{H}_n . The obtained realizations are given in terms of the generating function for the Bernoulli numbers. We also introduce an extension of the orthogonal and Lorentz algebras by quantum angles and study realizations of the extended algebras in \mathcal{H}_n . Furthermore, we show that by extending the generalized Heisenberg algebra \mathcal{H}_n , one can also obtain realizations of the Poincaré algebra and its extension by quantum angles.

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MSC:

- [81R60](#) Noncommutative geometry in quantum theory
- [33C65](#) Appell, Horn and Lauricella functions
- [14D15](#) Formal methods and deformations in algebraic geometry
- [11R60](#) Cyclotomic function fields (class groups, Bernoulli objects, etc.)
- [22E43](#) Structure and representation of the Lorentz group

Full Text: [DOI](#)

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