

Kolloquium Mathematische Physik

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q-deformed coherent states for generalized uncertainty relations with minimal length

We will report on recent results related to noncommutative spaces with commutation relation amongst their canonical variables which imply minimal lengths relations. We demonstrate the relation to q-deformed oscillator algebras and provide an explicit construction for Klauder coherent states related to non-Hermitian Hamiltonians with discrete bounded below and nondegenerate eigenspectrum. The underlying spacetime structure is taken to be of a noncommutative type with generalized version of Heisenberg's uncertainty relations implying minimal lengths. We represent cases for which the uncertainty relations for the constructed states are shown to be saturated in a Hermitian as well as a non-Hermitian setting. The computed value of the Mandel parameter dictates that the coherent wavepackets are assembled according to sub-Poissonian statistics. Fractional and superrevival times, indicating the superposition of classical-like sub-wave packets are clearly identified.

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