

Ergodic f -oscillators and their fractal structure

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It is shown that the position and momentum operators of ergodic f -oscillators have a fractal spectrum. The spectral set of such phase space operators is found to be homeomorphic to the Cantor set. This is done by means of a map to the famous Harper equation, which in turn is connected to the problem of an electron under a quasi periodic external field. Our result exhibits the non-trivial topological implications arising from the deformation of Heisenberg algebras.