

## Chaos in Bohmian mechanics of commensurate harmonic oscillators

### ABSTRACT

Bohmian mechanics is a causal interpretation of quantum mechanics in which there are well-defined particle trajectories guided by the wave function. Within this framework, it is shown that certain classical integrable systems can exhibit both periodic and chaotic behaviours. In this paper, we extend the work of Borondo et al. by investigating the behaviours of commensurate two-dimensional harmonic oscillator systems with different ratios of frequencies. We show that the system may produce chaotic behavior of Bohmian trajectories to be dependent on frequencies ratio. This result is illustrated numerically in computer experiments displaying the Bohmian trajectories.

**Keyword:** Bohmian trajectories; Oscillators