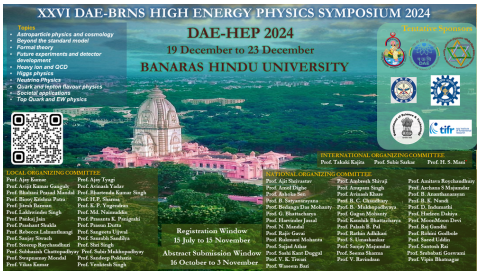

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Entropy and Information measure of an Anharmonic oscillator

we compare two methods for describing quantum system, using the example of an anharmonic oscillator: the Wigner distribution and the Husimi distribution. These help us to understand a system's information content, especially how it changes with different parameters, like anharmonicity (λ) and energy levels (n). For both distributions, we calculate various information measures such as mutual information, correlations and entropies such as Shannon and Rényi entropies . Our findings show that the Wigner distribution generally has lower entropy and is closer to the theoretical uncertainty limits, while the Husimi distribution leads to more information loss. The Wigner distribution also gives higher values for mutual information and correlations. This suggests that the Wigner distribution provides a more accurate picture of the system's information content, particularly for an anharmonic oscillator.

Field of contribution

Theory

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