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Characterization of dynamical phases for periodic-driven systems on the Poincar\'e disk

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In conformal invariant $(1+1)$-dimensional systems subjected to periodic driving,
there are heating and non-heating phases characterized by linear growth and oscillation of the entanglement entropy respectively [arXiv preprint arXiv:1805.00031]. In this work, we explore different setups without conformal symmetry by employing Poincar\'e disk realizations for periodic driven systems with $SU(1,1)$ symmetry.
We demonstrate these realizations by two examples: (a) Bose-Einstein condensates (BEC) quenching dynamics and (b) periodic-driven oscillators, both of which are experimentally accessible.
For BEC quenching dynamics, the heating and non-heating phases can be determined by both excitations and entanglement entropy. On the other hand, for the driven coupled oscillators, the phase diagram is enriched.
We observed there are distinct phases inside the heating phase which can only be captured by the entanglement measures.

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