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【104】 Long-lived coherence in driven spin systems: from two to infinite spatial dimensions

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Long-lived coherences, emerging under periodic pulse driving in the disordered ensembles of strongly interacting spins, offer immense advantages for future quantum technologies, but the physical origin and the key properties of this phenomenon remain poorly understood. We theoretically investigate this effect in ensembles of different dimensionality, and predict existence of the long-lived coherences in all such systems, from two-dimensional to infinite-dimensional, which are of particular importance for quantum sensing and quantum information processing. We explore the transition from two to infinite dimensions, and show that the long-time coherence dynamics in all dimensionalities is qualitatively similar, although the short-time behavior is drastically different, exhibiting dimensionality-dependent singularity.

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