

Strong Quantum Darwinism

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Quantum Darwinism and spectrum broadcast structure are two similar frameworks that can be used to study the emergence of objectivity (a flavour of classicality). However, a number of recent works have demonstrated that quantum Darwinism and spectrum broadcasting can have conflicting conclusions on the objectivity of state in particular, quantum Darwinism may conclude objectivity when spectrum broadcasting does not. To resolve this conflict, we define “strong Quantum Darwinism”, which distinguishes between classical and quantum information. Subsequently, we prove that strong quantum Darwinism is equivalent to spectrum broadcasting when combined with strong independence of the subenvironments, thus highlighting the correspondence between these frameworks and strengthening our understanding of the quantum-to-classical transition.

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