

Abstract Submitted  
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**What constitutes a resource state for measurement-based quantum computation?** ELEANOR RIEFFEL, NASA Ames Research Center, HOWARD WISEMAN, Griffith University — Support for universal measurement-based quantum computation (MBQC) is a sufficient condition for states to be considered resources for MBQC, but seems too strong as a necessary condition given known classes of MBQCs that appear to give an advantage over classical computing but which are not universal. We propose some minimal criteria that states must meet in order to be considered resource states for MBQC. We introduce (PRA 89, 032323 (2014)) the notion of inherently measurement-based computations, and give a series of necessary conditions for families of MBQCs to be considered inherently measurement-based. We propose that for a state to be considered a resource for MBQC it must, at minimum, support a family of MBQCs that is inherently measurement-based. Using these criteria, we explain why discord-free states cannot be resources for MBQC, in spite of claims to the contrary. We conclude with some open questions.

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