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Polarization Requirements for Ensemble Implementations of Quantum Algorithms with a Single Bit Output BRANDON ANDERSON, University of Texas at Dallas, DAVID COLLINS, Bucknell University — We compare the failure probabilities of ensemble implementations of quantum algorithms which use pseudo-pure initial states, quantified by their polarization, to those of competing classical probabilistic algorithms. Specifically we consider a class algorithms which require only one bit to output the solution to problems. For large ensemble sizes, we present a general scheme to determine a critical polarization beneath which the quantum algorithm fails with greater probability than its classical competitor. We apply this to the Deutsch-Jozsa algorithm to determine the critical polarization.

Prefer Oral Session
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Brandon Anderson
brandona@utdallas.edu
University of Texas at Dallas

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