

Abstract Submitted  
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**Riemannian Curvature in Quantum Computational Geometry**

HOWARD BRANDT, U.S. Army Research Laboratory — In the Riemannian geometry of quantum computation [1]-[3], the quantum evolution is described in terms of the special unitary group of n-qubit unitary operators with unit determinant. To elaborate on one aspect of the methodology, the Riemannian curvature on the group manifold is explicitly derived using the associated Lie algebra. This is important for investigations of the global characteristics of geodesic paths in the group manifold. [1] M. R. Dowling and M. A. Nielsen, “The Geometry of Quantum Computation,” *Quantum Information and Computation* **8**, 0861-0899 (2008). [2] H. E. Brandt, “Riemannian Geometry of Quantum Computation,” to appear in *Nonlinear Analysis* (2008). [3] H. E. Brandt, “Riemannian Geometry of Quantum Computation,” AMS Short Course Lecture, to appear in Proc. Symposia in Applied Mathematics., American Mathematical Society (2009).

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