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Fidelity of Arbitrary Single-Qubit Gates NATHAN STEIGER, Brigham Young University, PETER PEMBERTON-ROSS, Cambridge University — Recent work suggests that conservation laws limit the inherent accuracy of gate operations in quantum computing. One way to quantify these limitations is through a gate operation's fidelity. We extend and clarify previous work by Karasawa et al. (J. Phys. A **42**, 225303, (2009)) for an arbitrary single-qubit gate operation by incorporating the Schrödinger form of the uncertainty relation and arrive at a Bloch sphere representation of the gate fidelity. We find that these modifications are non-trivial and could have important ramifications for quantum computing.

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