

Abstract Submitted  
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**Pulse-gated quantum dot hybrid qubit**<sup>1</sup> S.N. COPPERSMITH, TECK SENG KOH, JOHN KING GAMBLE, M.A. ERIKSSON, MARK FRIESEN, Department of Physics, University of Wisconsin-Madison — A quantum dot hybrid qubit formed from three electrons in a double quantum dot has the potential for great speed, due to presence of level crossings where the qubit becomes charge-like. Here, we show how to exploit the level crossings to implement fast pulsed gating. We develop one- and two-qubit dc quantum gates that are simpler than the previously proposed ac gates [1]. We obtain closed-form solutions for the control sequences and show that the gates are fast (sub-nanosecond) and can achieve high fidelities.

[1] Z. Shi, et al., Phys. Rev. Lett. 108, 140503 (2012).

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