Abstract Submitted
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Graphene Josephson Qubit COLIN BENJAMIN, JIANNIS K. PACHOS, School of Physics & Astronomy, University of Leeds — We propose to combine the advantages of graphene, such as easy tunability and long coherence times, with Josephson physics to manufacture qubits. These qubits can either be built around a 0 and π junction and controlled by external flux or a d- wave Josephson junction can itself be tuned via a gate voltage to create superpositions between macroscopically degenerate states. We show that ferromagnets are not required for realizing π junction in graphene, thus considerably simplifying its physical implementation. We demonstrate that one qubit gates, such as arbitrary phase rotations and the exchange gate, can be implemented easily.

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