

Abstract Submitted
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Can a strain yield a qubit?¹ COLIN BENJAMIN, National Institute of Science education and Research, Bhubaneswar, India — A Josephson qubit is designed via the application of a tensile strain to a topological insulator surface, sandwiched between two s-wave superconductors. The strain applied leads to a shift in Dirac point without changing the conducting states existing on the surface of a topological insulator. This strain applied can be tuned to form a π -junction in such a structure. Combining two such junctions in a ring architecture leads to the ground state of the ring being in a doubly degenerate state- “0” and “1” states of the qubit. A qubit designed this way is easily controlled via the tunable strain. We report on the conditions necessary to design such a qubit. Finally the operating time of a single qubit phase gate is derived.

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