Using microwave radiation to detect local topology or to induce topological properties in three-terminal Josephson junctions

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We propose an experimental protocol to locally detect the Berry curvature of a three-terminal Josephson junction with a quantum dot by performing an ac nonlocal conductance measurement. We compare the results of an infinite-gap approximation and of the full Keldysh calculation including the continuum of quasiparticles. The comparison is favourable due to the concentration of the Berry phase in the low-energy regions. We also propose to induce topological phases with nonzero Chern numbers by irradiating a three-terminal junction, breaking time-reversal symmetry with a suitably polarised microwave field.