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Emergent Magnetic Monopole Charges in a Two Qubit System TIAGO GRANGEIRO SOUZA BARBOSA LIMA, MICHAEL KOLODRUBETZ, ANATOLI POLKOVNIKOV, Boston Univ — The topology of two coupled qubits has recently been explored using dynamical measurements of their Berry curvature  $\vec{F}$ . Its integral gives the topologically invariant Chern number, which natural maps to the presence of magnetic monopole charges in parameter space. We suggest a method for measuring the magnetic monopole charge density and detail its motion as external parameters are varied. Using Maxwell's equations with the addition of magnetic monopoles, we obtain the effective charge density and the current density as a function of the parameters. We show how particular choices for parameters give rise to peculiar motion of the monopole charges, which can go from isolated charges to continuous charge distributions like rings and surfaces by properly changing the system's symmetries through its parameters. Finally, we probe the interesting but as yet unexplored consequences on  $\nabla \times \vec{F}$  as said changes are made.

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