

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Fidelity and quantum chaos in the nanocircuit for the Josephson flux qubit** E. N. POZZO, Centro Atomico Bariloche, Argentina, D. DOMINGUEZ, Centro Atomico Bariloche, Argentina — We study the dynamics of the Josephson flux qubit of Mooij et al, which consists on a SQUID with 3 Josephson junctions. We find that the classical dynamics is chaotic and that the onset of chaos occurs at low energies. We perform numerical simulations of the time-dependent Schrodinger equation of the flux qubit. We study the fidelity or Loschmidt echo (LE), corresponding to the sensibility of the quantum dynamics to a perturbation in the hamiltonian, for high energies. We analyze the effect of perturbations in the magnetic field, in the gate voltage and in the critical currents. We obtain the critical value of the perturbation where the chaotic Lyapunov regime starts in each case. We will show results as a function of the ratio between the Josephson energy and the charging energy.

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Date submitted: 30 Nov 2004

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