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Landau-Zener Interference in Multilevel Superconducting Flux Qubits Driven by Strong Fields[1] YANG YU, XUEDA WEN, National Laboratory of Solid State Microstructures and Department of Physics, Nanjing University, Nanjing 210093, China — We proposed a model to investigate the Landau-Zener (LZ) interference in multilevel superconducting flux qubits driven by large-amplitude microwave fields. The calculated interference patterns agree remarkably with those of the experiments. Moreover, the interference depends on the driving-frequency and dephasing rate. The dephasing generally destroys the interference while increasing frequency rebuilds the interference at large dephasing rate. At certain driving frequency and dephasing rate, the interference shows some anomalous features as observed in recent experiments. Our results can be used to understand the LZ interference in multilevel quantum systems under different driving frequencies and decoherence rates.

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