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Landau-Zener-Stückelberg interference in the presence of quantum noise¹ YANG YU, LINGJIE DU, MINJIE WANG, National Laboratory of Solid State Microstructures and Department of Physics, Nanjing University, Nanjing 210093, China — We investigated the Landau-Zener-Stückelberg (LZS) interference in strongly driven two-level systems subjected to quantum noise. The transition rate induced by consecutive LZ transitions is obtained, from which LZS interference can be analytically calculated based on rate equation. In the presence of significant frequency dependent noise, the evolving paths of LZS interference is going to be detoured. Therefore, the position of the resonant peaks is shifted and a stationary population inversion in TLS without involving the third qubit state is generated. The LZS interferometry can be used to investigate the noise property hence the decoherence source of the system. In addition, the stationary population inversion may find application in lasing and microwave cooling.

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Yang Yu
National Laboratory of Solid State Microstructures and
Dept of Physics, Nanjing University, Nanjing 210093, China

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