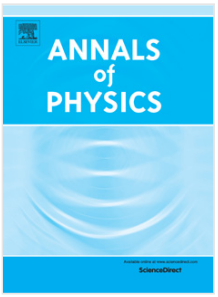

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Fisher Information Due to a Phase Noisy Laser Under Non-Markovian Environment

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More recently, K. Berrada [Annals of Physics 340 (2014) 60-69] [1] studied the geometric phase of a two-level atom system driven by a phase noise laser under non-Markovian dynamics in terms of different parameters involved in the whole system, and collapse and revival phenomena were found for large class of states. In this paper, using this noise effect, we study the quantum fisher information (QFI) for a two-level atom system driven by a phase noise laser under non-Markovian dynamics. A new quantity, called QFI flow is used to characterize the damping effect and unveil a fundamental connection between non-Markovian behavior and dynamics of system-environment correlations under phase noise laser. It is shown that QFI is disappeared suddenly followed by a sudden birth depending on the kind of the environment damping. QFI flow provides an indicator to characterize the dissipative quantum system's decoherence by analyzing the behavior of the dynamics non-Markovian coefficients.

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I. INTRODUCTION

Parameter estimation is a significant pillar of different branches of science and technology, and developed new techniques in measurement for parameter sensitivity have often led to scientific breakthroughs and technological advancement. There is a great deal of work on phase estima-

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