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Nowadays, matter-wave interferometry has become a powerful technique for measuring acceleration, gravity gradient, and constant rotation with enormous precision. Here, we explore an atom interferometer which is highly sensitive to unknown constant angular acceleration. By modeling rotation with fixed axis and constant angular acceleration, we employ atom-interferometric scheme based on a sequence of five Raman laser pulses. For a small enough initial angular velocity, we have found that the interferometer has a very high contrast, more precisely it is reduced only by a correction scaling with the sixth order of this initial angular velocity. On the other hand, the leading term of the interferometer phase is linearly proportional to the angular acceleration and scales with the fourth power of the total interferometer time. In addition, we have investigated the feasibility of the proposed scheme for the typical ground- and space-based configurations, such as a rotating platform on earth and satellites.

Poster Abstract

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