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Initial Phase Dependence of the Sagnac Effect for Matter Waves MARTIN KANDES, University of California, San Diego, MICHAEL BROMLEY, The University of Queensland, RICARDO CARRETERO, San Diego State University — We simulate the interference between two counterpropagating matter wave packets confined to a uniformly rotating, circular ring potential in order to study the dynamics of a simple matter wave Sagnac interferometer. Here, we show that the initial phase of the wave packets themselves determines how the Sagnac phase shift accumulates as a function of time. Most interestingly, we find that the phase shift occurs in discrete phase jumps when the wave packets start at rest with respect to the rotating reference frame of the system.

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