Large momentum transfer atom interferometer using sequential Bragg diffraction

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Light pulse atom interferometers are implemented for precision measurements in various areas such as gravito-inertial measurements or measuring fundamental constants. In addition, atom interferometers with an increased sensitivity are potential candidates for testing fundamental physics in gravitation, dark sector physics, or for gravitational waves detection. In order to increase their sensitivity, a promising idea is to increase the momentum separation between the two arms of the interferometer. We are at present constructing such a Large Momentum Transfer (LMT) atom interferometer. Bragg diffraction is a corner stone for new schemes in the LMT beam splitters. In this "poster" session, I will present a 80 $\hbar k$ LMT-interferometer based on sequential high order Bragg pulses. I will also comment the inherent multi-state nature of quasi-Bragg interferometers, leading to spurious interferometers and complicate the phase estimation. Finally, I will present experimental study of the phase response function of our interferometer.

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