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We present a novel approach to achieve Large Momentum Transfer (LMT) through stroboscopic stabilization of a Floquet state in an accelerated optical lattice. Using optimal control protocols, we prepare the Floquet state, enabling fast LMT and significantly improving the efficiency of the beam splitter. Using this technique, we demonstrate an atom interferometer with a maximum momentum separation of 600 photon recoils ($600\hbar k$). In addition, we characterize the robustness of these protocols to BEC velocity dispersion and lattice depth fluctuations.

Session Classification: Poster Session & Wine & Coffee