

Abstract Submitted  
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**Design and Implementation of a Fast Imaging System for Detection of Optical Lattices**<sup>1</sup> MATTHEW GILLETTE, ANDREW HACHTEL, ETHAN CLEMENTS, SHAN ZHONG, RAY DUCAY, SAMIR BALI, Miami University — A home built system for imaging optical lattices is presented. Our imaging system uses a repurposed astronomy camera- the complete system costs less than \$5000 while rivaling the performance of a commercially available system which costs \$40-50000. The camera must have an extremely low dark current, high quantum efficiency, as well as the ability to take precisely timed millisecond exposures. Using LabVIEW a sequence of precise electronic pulses is created to control the laser beams in order to load the lattice structure with cold atoms. When running a LabVIEW VI at millisecond timescales Windows introduces inaccuracies in pulse timing. A master slave computer setup, called a real time target (RTT) is created in order to increase this accuracy to the microsecond level.

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