Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Multi-Beam Shuttering, Pulsing, and Intensity Control Using Liquid Crystals SARAH BICKMAN, STEPHANIE MCMAHON, JEREMY SHUGRUE, BENJAMIN LUEY, JUAN PINO, SCOTT ROMMEL, MICHAEL ANDERSON, Vescent Photonics — To date, most experiments involving lasers have required space-consuming acousto-optic modulators and mechanical shutters to control the intensity of laser beams used in cold-atom experiments. To support emerging cold-atom sensors such as atomic clocks, inertial navigation units, and magnetometers these complex electro optics must be replaced with compact components that can operate in a field environment. Using liquid-crystal spatial light modulators we have demonstrated an optical component that separates a single laser source into multiple beam paths that can be independently controlled. Each beam can be shuttered with 70 dB of contrast, pulsed down to 12 us, and intensity stabilized with 150 kHz loop bandwidth. These devices operate in the wavelength range of 630-1000 nm. We will present current designs and results of the liquid crystal multi-beam shutter and how it enables complete and compact cold-atom laser systems the size of a paperback novel.

Sarah Bickman
Vescent Photonics

Date submitted: 26 Jan 2012 Electronic form version 1.4