Abstract Submitted
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Brownian dynamics simulations of optical blasting technique for manipulating colloidal crystal grain boundaries[1] JEREMY WANG, MAYA MARTIROSSYAN, CAITLIN CASH, KEMPER LUDLOW, ALEJANDRO BAPTISTA, SHARON GERBODE, Harvey Mudd College — We use Brownian Dynamics simulations to explore the new experimental "optical blasting" technique, in which a 1064 nm laser creates repulsive gradient forces on index-mismatched colloidal crystal particles. In the simulations, laser-induced forces are approximated using ray optics to calculate momentum transfer to the colloidal particles. Like our colloidal experiments, we find that the simulated optical blast forms small holes in 2-D colloidal crystals. When these holes form near grain boundaries (GB) the subsequent recovery of the crystal attracts the GB toward the location of the blast. By recreating this experimental setup *in silico*, we systematically study how the effective attraction between the blast and the GB depends on the relative orientations of the crystal grains and the GB.

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