Abstract Submitted
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Probing colloidal grain boundary dynamics using a novel optical blasting technique[1] MAYA MARTIROSSYAN, JEREMY WANG, CAITLIN CASH, KEMPER LUDLOW, ALEJANDRO BAPTISTA, SHARON GERBODE, Harvey Mudd College — We introduce an "optical blasting" technique that allows for grain boundary manipulation of colloidal crystals. Like an inverted optical tweezer, optical blasting employs a 1064 nm laser to create repulsive gradient forces on index mismatched colloidal particles, producing a hole within monolayer colloidal crystals. We find that optical blasting near grain boundaries in polycrystalline monolayer crystals of 1.2 micron silica spheres causes asymmetric melting near the blast. The subsequent recrystallization pulls the grain boundary toward the blast. We study this effective attraction between the blast and the grain boundary, and use the technique to deform grain boundaries and ultimately create new grains within an existing crystal.

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