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Direct observation of the nucleation in colloidal solid-solid transitions¹ YI PENG, FENG WANG, ZIREN WANG, YILONG HAN, Department of Physics, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong, China — We studied the solid-solid transitions between square and triangular lattices in thermal sensitive microgel colloidal thin films by video microscopy. A novel two-step nucleation process was observed in a locally heated single crystalline domain: typically a ~ 60 -particle liquid nucleus was first from the square lattice and then rapidly transformed to a solid nucleus with triangular lattice. Such a post-critical triangular-lattice nucleus grew linearly and induced grain boundaries around it. Nuclei were triggered by the merging of stronger vibrating areas instead of precursor defects. The critical nucleus size was measured from the mean first passage time of the nucleus size.

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