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Feasibility Study of Directed Self-Assembly of Semiconductor Quantum Dots LAWRENCE FRIEDMAN, JIAN XU, Pennsylvania State University — Strain mismatched semiconductors are used to form Self-Assembled Quantum Dots (SAQDs). An important step in developing SAQD technology is to control randomness and disorder in SAQD arrays. There is usually both spatial and size disorder. Here, it is proposed to use spatially varying heating as a method of to direct self-assembly and create more ordered SAQD arrays or to control placement of single dots or dot clusters. The feasibility of this approach is demonstrated using a 2D computational model of Ge dots grown in Si based on finite element analysis of surface diffusion and linear elasticity.

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