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Expanding Memory Capacity in a Particle Swelling System[1] JAKE MANDEL, JENNY KWAK, NATASHA PROCTOR, HILARY JACKS, Cal Poly, San Luis Obispo, NATHAN KEIM, Pennsylvania State University, — Memory represents the ability to encode and access information in a system. We study memory in a simulation of particles that are swelled under confinement. The particles swell to a given size and repel from any neighboring particles they touch. One piece of information, particle size, is encoded by repeating this process until the system reaches equilibrium, where no particle interactions occur. This information is later read out by swelling the particles incrementally until particle interaction is detected. Using anisotropic transformation, we can encode an additional piece of information. Introducing a favored direction is used to vary the number of particle interactions with respect to the favored direction and its corresponding directions. We find that anisotropic manipulation expands the memory storing capacity to include the encoding of direction.

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