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Hysteresis and Return Point Memory in Artificial Spin Ice Systems CYNTHIA REICHHARDT, Los Alamos National Laboratory, ANDRAS LIBAL, Babes-Bolyai University, CHARLES REICHHARDT, Los Alamos National Laboratory — We investigate hysteresis loops and return point memory for artificial square and kagome spin ice systems by cycling an applied bias force and comparing microscopic effective spin configurations throughout the hysteresis cycle. Return point memory loss is caused by motion of individual defects in kagome ice or of grain boundaries in square ice. In successive cycles, return point memory is recovered rapidly in kagome ice. Memory is recovered more gradually in square ice due to the extended nature of the grain boundaries. Increasing the amount of quenched disorder increases the defect density but also enhances the return point memory since the defects become trapped more easily.

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