Local studies of AC demagnetization in a model frustrated magnet[1] JIE LI, XIANGLIN KE, CRISTIANO NISOLI, PAUL LAMMERT, VINCENT CRESPI, PETER SCHIFFER, The Penn State Univ. — We have studied the process of ac demagnetization using a model system consisting of single-domain ferromagnetic islands arranged on perpendicular square lattices such that the interaction between the islands are frustrated by the geometry of the arrays. The sample is first subjected to an oscillating magnetic field whose magnitude is stepped down by different step sizes and the sample is rotating at the same time. We find that the net moment of the arrays can be readily brought to near zero with the magnetic field step size below a certain threshold value. However the interaction energy of the demagnetized array state continues to decrease linearly with decreasing step size even as the step size approaches zero. We characterize the result in terms of developing local correlations between the island moments, with strong analogies to other athermal magnetic systems. This research has been supported by the Army Research Office.

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