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Microscopic return point memory in Co/Pd multilayer films
KEOKI SEU, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, USA 94720, RUN SU, DANIEL PARKS, Physics Department, University of Oregon, Eugene, OR, USA 97403, SUJOY ROY, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, USA 94720, ERIK SHIPTON, ERIC FULLERTON, Electrical and Computer Engineering, University of California, San Diego, CA, USA 92093, STEPHEN KEVAN, Physics Department, University of Oregon, Eugene, OR, USA 97403 — We have conducted resonant x-ray scattering with a coherent beam on Co/Pd, a system which exhibits perpendicular magnetization. The system forms labyrinth domains and we collect a pure magnetic signal in our transmission geometry. The energy of the incident X-rays is tuned to the Co L_3 edge and the coherence is established with a 10 um pinhole. The return and complementary point memory, defined by the correlation between the speckle pattern at whole loops and half-loops respectively, depends on the applied field and is a maximum near initial magnetization reversal, indicating that the system has strong memory during nucleation. As the field is increased, the memory decreases and reaches a minimum as the magnetization begins to saturate. This indicates that the system follows a large path in configuration space as the labyrinths evolve with the applied field.

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