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Avalanche Spatial Structure: Viewing Crackling Noise through Windows YAN-JIUN CHEN, STEFANOS PAPANIKOLAOU, JAMES P. SETHNA, LASSP, Cornell University, GIANFRANCO DURIN, INRIM and ISI foundation, Torino, Italy, STEFANO ZAPPERI, INFM-CNR center, Modena, and ISI, Torino, Italy — In imaging experiments of Barkhausen noise in thin films, magnetic avalanches at the boundaries present challenges to analysis. Large avalanches are removed from the distribution, and the portion inside the viewing window may sometimes be treated as smaller avalanches. We analyze the scaling behavior of different categories of avalanches in artificially-windowed simulations of Barkhausen noise to examine the effect of window size on scaling relations. In passing, we discuss the average spatial shapes of avalanches, multivariable scaling functions, and the use of nonlinear-least-squares methods for exploring and reporting universal scaling functions.

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