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**Probing driven first order structural transitions with resistivity noise** U. CHANDNI, ARINDAM GHOSH, Indian Institute of Science — We study the avalanche-mediated driven first order structural transition in nickel titanium shape memory alloys with time-dependent fluctuations in electrical resistivity. Higher order statistics of the fluctuations, or noise, has been used as a kinetic detector of the underlying two stage athermal phase transition. We have found that the non-gaussian component of the higher order statistics carries significant information about the transition parameters and is coupled to the microscopic origin of the phase transition. The results can be explained with a model based on three competing time scales dependent on avalanche relaxation, thermal fluctuations and drive rate. The transition temperature was found to decrease with increasing drive rate indicative of the increased possibility of the system being driven towards the athermal limit. Moreover, the magnitude of the non-gaussian component is found to have signatures of the extent of correlations in the system and hence a viable tool to detect any overlap of avalanches in space or time. The study establishes noise as a sensitive tool to probe the kinetics of driven structural transitions which can be exploited in a variety of other systems. References: U. Chandni et. al, Phys. Rev. Lett. 102, 025701 (2009) U. Chandni and A. Ghosh, Phys. Rev B. **81**, 134105 (2010)

U. Chandni
Indian Institute of Science

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