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Title:	Verification of scalable ultra-sensitive detection of heterogeneity in an electronic circuit
Authors:	Kohar, Vivek (/jspui/browse?type=author&value=Kohar%2C+Vivek) Choudhary, Anshul (/jspui/browse?type=author&value=Choudhary%2C+Anshul) Singh, K.P. (/jspui/browse?type=author&value=Singh%2C+K.P.) Sinha, Sudeshna (/jspui/browse?type=author&value=Sinha%2C+Sudeshna)
Keywords:	Heterogeneity Impact Nonlinear
Issue Date:	2013
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Citation:	European Physical Journal: Special Topics, 222, pp. 721–728.
Abstract:	We study the impact of small heterogeneity in signals applied to globally coupled nonlinear bistable elements. In the absence of coupling, the collective response is simply the average of all the uncorrelated signals. When the elements are coupled and a bias is applied, we find that even a very small number of different inputs are able to drag the collective response towards the stable state of the minority inputs. In our explicit demonstration we have taken Schmitt triggers as the basic nonlinear bistable elements, and the inputs are encoded as voltages applied to them. The average of output voltages of all the Schmitt triggers corresponds to the global output of the system. We also observe that the minimum heterogeneity that can be detected scales with ratio of threshold voltage to source voltage of the Schmitt triggers, and can be brought down to the limit of single bit detection.
URI:	https://link.springer.com/article/10.1140/epjst/e2013-01875-2 (https://link.springer.com/article/10.1140/epjst/e2013-01875-2) http://hdl.handle.net/123456789/2826 (http://hdl.handle.net/123456789/2826)
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