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Title:	Preventing catastrophes in spatially extended systems through dynamic switching of random interactions
Authors:	Choudhary, Anshul (/jspui/browse?type=author&value=Choudhary%2C+Anshul) Kohar, Vivek (/jspui/browse?type=author&value=Kohar%2C+Vivek) Sinha, Sudeshna (/jspui/browse?type=author&value=Sinha%2C+Sudeshna)
Keywords:	Blow-ups Catastrophe Complex networks Dynamic links
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Publisher:	Indian Academy of Sciences
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Abstract:	In this paper, we review and extend the results from our recently published work [Scientific Reports (Nature) 4, 4308] on taming explosive growth in spatially extended systems. Specifically, we consider collections of relaxation oscillators, which are relevant to modelling phenomena ranging from engineering to biology, under varying coupling topologies. We find that the system witnesses unbounded growth under regular connections on a ring, for sufficiently strong coupling strengths. However, when a fraction of the regular connections are dynamically rewired to random links, this blow-up is suppressed. We present the critical value of random links necessary for successful prevention of explosive growth in the oscillators for varying network rewiring time-scales. Further, we outline our analysis on the possible mechanisms behind the occurrence of catastrophes and how the switching of links helps to suppress them.
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