

Are extreme increments the better predictable the more extreme they are?

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We investigate precursors and predictability of extreme events in time series. The events we are focusing on consist in large increments within successive time steps. We are especially interested in understanding how the quality of the predictions depends on the strategy to choose precursors, the size of the event and the correlation strength. We study the prediction of extreme increments analytically in an AR(1) process and numerically in wind speed recordings and long-range correlated ARMA data. We evaluate the success of predictions via creating receiver operator characteristics (ROC-curves). Surprisingly, we obtain better ROC-curves for less correlated data. Furthermore, we observe an increase of the quality of predictions with increasing event size in all examples. Both effects can be understood by using the likelihood ratio as a summary index for smooth ROC-curves.

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- [1] S. Hallerberg, E. G. Altmann, D. Holstein, H. Kantz *Precursors of Extreme Increments*, <http://lanl.arxiv.org/abs/physics/0604167>