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Asymmetric random matrices:

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Complex systems are typically represented by large ensembles of

extract information from such multivariate ensembles and identify in a

observations. Correlation matrices provide an efficient formal framework to

quantifiable way patterns of activity that are reproducible with statistically

significant frequency compared to a reference chance probability, usually

provided by random matrices as fundamental reference. The character of

random matrices to be used for the definition of a baseline reference. For standard correlation matrices this is the Wishart ensemble of symmetric

matrices are required to adequately capture the asymmetry. Here we first

random matrices. The real world complexity however often shows

asymmetric information flows and therefore more general correlation

the problem and especially the symmetries involved must guide the choice of

What do we need them for?

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summarize the relevant theoretical concepts. We then present some examples of human brain activity where asymmetric time-lagged correlations are evident and hence highlight the need for further theoretical developments.	Subjects:	Data Analysis, Statistics and Probability	
	summarize the examples of h are evident ar developments	e relevant theoretical concepts. We then present some uman brain activity where asymmetric time-lagged correlations and hence highlight the need for further theoretical s.	

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