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Detecting long-range tele-connections in the climate network via ordinal pattern analysis

J. I. Deza (1), M. Barreiro (2), and C. Masoller (1)

(1) Departament de Física i Enginyeria Nuclear, Universitat Politecnica de Catalunya, Colom 11. E-08222, Terrassa, Barcelona, Spain., (2) Instituto de Física, Facultad de Ciencias, Universidad de la República, Iguá, 4225, Montevideo, Uruguay.

We study the global climate network by means of nonlinear time series analysis of monthly averaged surface air temperature anomalies. We employ various methods to infer climate interdependencies, like the linear cross correlation and the mutual information computed from the actual data and from a symbolic representation of the date, based on ordinal patterns. Special emphasis is made on detecting weak and long range connections (teleconnections). We [U+FB01]nd that the linear measure to construct the climate network tends to emphasize the connection between the tropics and the extratropics, while the nonlinear methods emphasize the regional internal atmospheric dynamics. We also report evidence of correlations between the poles and di[U+FB00]erent regions, some of them very well limited geographically.