Multiscaling Analysis of Wind Velocity

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The temporal structure of wind was investigated by means of temporal correlations of 10-min wind time series measured over a period of one year (2004). The Hurst exponent (H), one of a number of methods to identify the existence of long-range correlations in experimental data, has been applied to quantify self-similarity scaling and correlations in the mesoscale temporal range. The Hurst exponent can be calculated by several different algorithms, each of which has particular advantages and disadvantages. One of these methods is via Structure Functions (SF's) that has not yet been widely used in wind time series. In this work, SF method has been used in measured wind fluctuation for each month of the studied year. The results point out a multiscaling or scaling behavior, depending on the month analyzed, from 10 minutes till 3 hours, approximately, with a significant anti-persistence character.