



## **On the Interpretation of Running Trends as Summary Statistics for Time Series Analysis**

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In recent years, running trends analysis (RTA) has been widely used in climate applied research as summary statistics for time series analysis. There is no doubt that RTA might be a useful descriptive tool, but despite its general use in applied research, precisely what it reveals about the underlying time series is unclear and, as a result, its interpretation is unclear too. This work contributes to such interpretation in two ways: 1) an explicit formula is obtained for the set of time series with a given series of running trends, making it possible to show that running trends, alone, perform very poorly as summary statistics for time series analysis; and 2) an equivalence is established between RTA and the estimation of a (possibly nonlinear) trend component of the underlying time series using a weighted moving average filter. Such equivalence provides a solid ground for RTA implementation and interpretation/validation.