

FORECASTING NON-STATIONARY TIME SERIES BY WAVELET PROCESS MODELLING

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Abstract. Many time series in the applied sciences display a time-varying second order structure. In this article, we address the problem of how to forecast these non-stationary time series by means of non-decimated wavelets. Using the class of Locally Stationary Wavelet processes, we introduce a new predictor based on wavelets and derive the prediction equations as a generalisation of the Yule-Walker equations. We propose an automatic computational procedure for choosing the parameters of the forecasting algorithm. Finally, we apply the prediction algorithm to a meteorological time series.

Key words and phrases: Local stationarity, non-decimated wavelets, prediction, time-modulated processes, Yule-Walker equations.

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