

In this paper, a modified auto regressive integrated moving average (ARIMA) modeling procedure that can capture time correlation and probability distribution of observed wind-speed time-series data is presented. The procedure introduces frequency decomposition (splitting the wind-speed data into high frequency (HF) and low-frequency (LF) components), shifting, and limiting in addition to differencing and power transformation which are used in the standard ARIMA modeling procedure. The modified modeling procedure is applied to model 10 minute average measured wind-speed data from three locations in the Baltic Sea area and the results show that the procedure can capture time correlation and probability distribution of the data. In addition, it is shown that, for 10-min average wind-speed data in the Baltic Sea area, it could be sufficient to use ARIMA(6,0,0) and ARIMA(0,1,6) to model the HF and LF components of the data, respectively. It is also shown that, in the Baltic Sea area, a model developed for an observed wind-speed data at one location could be used to simulate wind-speed data at a nearby location where only the average wind-speed is known.

