Aggregation and stochastic features of high-frequency hydroclimatic time series

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Motivation - practical





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Motivation - conceptual

role of variability versus mean

influence of sampling rate on time series features

discrete towards continuous time limit



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effect of temporal aggregation on stochastic features of hydro-climatic time series

\blacktriangleright sample length versus aggregation level \rightarrow simulations





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10-min atmospheric pressure @Cascais station





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Linear trends





Autocorrelation





Air temperature @Cascais

DFA (Detrended Fluctuation Analysis)

	H (Hurst coefficient)		
10-min	0.81		
1-hour	0.93		
1-day	1.2		



Water-level @Hornbæk tide-gauge

DFA (Detrended Fluctuation Analysis)

	H (Hurst coefficient)		
1-hour	0.89		
1-day	0.74		
1-month	0.62		
1-year	0.60		



Simulated series





Simulated series





Simulated series

DFA (Detrended Fluctuation Analysis)

	H=0.6	H=0.7	H=0.8	H=0.9
1-hour	0.598	0.696	0.796	0.895
1-day	0.600	0.699	0.798	0.898
1-month	0.616	0.716	0.815	0.916
1-year	0.722	0.820	0.910	0.991



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- ► hydroclimatic series → more complex temporal structure than simulated long-memory processes



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