



Stationary block bootstrap for Sulphur dioxide

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Abstract

Air pollution is cause of serious effects on human health. Sulphur dioxide (SO_2) is one of the most spread, aggressive and dangerous air pollutant.

In this paper we will face, by bootstrap methods for time series, the problem of SO_2 dispersion in the industrial area of Milazzo (Messina, Italy).

In this area there are two important sources of pollution. Milazzo is object of interest by Italian government that declared it "High environmental risk area".

In this paper, we will develop the procedure of Stationary Block Bootstrap (Politis and Romano, 1994) that consists in resampling the original observation in blocks of consecutive observations with replacement from a set of blocks in such a way to capture the dependence structure of neighbored observations of the original series and to obtain a new series of approximately the same length of the original one. This method uses blocks of random lengths rather than blocks of fixed length utilized in the other bootstrap methods. The Stationary Block Bootstrap is applied to stationary weakly dependent time series.

Results show that Stationary Block Bootstrap has turned out as a very powerful method for dependent data and it represents a valid alternative to the parametric one.

References:

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