Multiple-try Metropolis Hastings for modeling extreme PM10 data

ABSTRACT

Awareness of catastrophic events brings the attention to work out the relationship of these events by using statistical analysis of Extreme Value Theory (EVT). This study focused on extreme PM10 data using a Gumbel distribution which is one of the Extreme Value distributions. The parameters were estimated using the new Bayesian approach in extreme called Multiple Try Metropolis-Hastings algorithms. We compared this approach with another Markov Chain Monte Carlo approach which is the classical Metropolis-Hastings algorithm and the frequentist approach, Maximum Likelihood Estimation. It appears that these three approaches provide comparable results. Data are taken for Pasir Gudang station for year 1996 to 2010.

Keyword: Air quality; Gumbel distribution; Multiple-try Metropolis Hastings; Return value