Turning Band – Hidden Markov Combined Model for convective rainfall in arid Regions

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A combination of a Turning Band Model with a Hidden Markov Chain is being proposed for the simulation of convective rainfall in arid regions. Within each band, the stochastic generator of rainfall depths uses Gamma-Laguerre probability distributions, a polynomial generalization of Gamma distributions, which provide the potentially most general combination of polynomial-exponential distribution functions, limited only by the level of parsimony imposed by the modeller. An application to the disaggregation of monthly precipitation from Mauritania is presented.