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Simulation of multivariate random variables using a non-Gaussian copula.

Environmental variables are known to be dependent in space and time. Detecting and modeling spatial and temporal dependencies of multivariate data are fundamental to many practical applications. Furthermore, simulation of multivariate random variables are commonly used in engineering applications such as uncertainty analysis, risk assessment, ensemble forecasting and decision making among others. In this paper a non-Gaussian copula derived by a non-monotonic transformations of the Gaussian copula is introduced for simulation of spatially dependent random variables. The non-monotonic transformation is performed using two parameters that express the anomaly from the Gaussianity. The asymmetry of dependence structures, if exists, can be described using the copula parameters. (Received August 15, 2009)