

A class of multivariate extreme value distributions with heterogeneous margins

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Many problems which involve applications of extreme value theory show an essential multivariate nature and recent development of the theory in this field deal with the construction of multivariate extreme value distributions. Owing to the nature of the problem under examination, extreme values to be analyzed jointly, for example a set of maximum wind speeds across directions, may have different limiting distributions among three possible types. It seems, however, that explicit expressions of multivariate extreme value distributions with heterogeneous margins are not present in the literature. This dictate the need for constructing multivariate extreme value distributions with given univariate marginal extreme value distributions of different types. This presentation will describe a procedure of constructing multivariate extreme value distributions with given margins which may be either heterogeneous or not. A class of distributions of this kind will be introduced and we will show that the marginal distributions, of any order, associated to a generic k -dimensional distribution of this class, are of the same form as the k -dimensional distribution. An example of construction of a trivariate extreme value distribution with margins of three different types will be used to illustrate the procedure.

Key Words: Constructing multivariate extreme value distributions, trivariate extreme value distribution