

# Toward a Copula Theory for Multivariate Regular Variation

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Multivariate regular variation describes the limiting deviation of joint tail probabilities of a random vector from tail probabilities of its norm (any norm) and is often used to study heavy-tail phenomena observed in data analysis in various fields, such as finance and insurance. Multivariate regular variation can be analyzed in terms of intensity measure or spectral measure, but can also be studied by using the copula method. In this talk, we will discuss the basic ingredients of a measure-theoretic copula theory for multivariate regular variation, and our method is based on extraction of rank-invariant dependence from the intensity measure by standardizing its margins. Our method also enables us to facilitate tail dependence analysis for copulas by using the probabilistic and statistical tools already developed for multivariate regular variation. Various examples as well as the advantages and disadvantages of our copula method will be discussed.

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