

TOTAL VARIATION AND COVARIANCE STRUCTURE IN COMPOSITIONAL DATA

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One of the main highlights of the compositional data analysis is the establishment of the covariance structure in compositional data (Aitchison 1986). As it has been demonstrated, this covariance structure must be expressed under the form of ratios of components, since compositional data is characterized by the fact that they give just relative information. Furthermore, it has been proved that this covariance structure is determined by the $1/2dD$ half values of the covariance matrix. Moreover, this covariance matrix provides another highlight in the study of compositional data, that is the total variation concept. This term enables the quantification of the existing variability in a given data set. All these has revealed that compositional data can only provide information among the relationships of two components on the basis of, at least, a 3-parts compositions, since they should be logratio transformed.

In this study the attention is centred in the existing relations among the variation matrix, the centred logratio covariance matrix and logratio covariance matrix. It has been observed that the vector of logratio covariance matrix traces can be used, together with the total variation, as a tool to explore the relation of compositional components in a 2-parts composition basis, providing direct information on the relationships between pairs of components.