

Math Geol
DOI 10.1007/s11004-007-9118-4

Understanding Geological Data Distribution and Orientation via Correspondence Analysis

Case study: Évora High-Grade Metamorphic Terrains, Portugal

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Received: 14 December 2004 / Accepted: 17 March 2006
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Abstract Insufficient field test results and a sufficiently large degree of spatial disorder exhibited by melt flow properties on sheared migmatites leads us to use stochastic methods to describe the distribution and orientation of leucogranitoid veins in sheared continental crust. Qualitative data present challenges to evaluators seeking to analyse visual information from spatial observations. In this manuscript, we work through a structured approach to analyse qualitative data based on an interactive process of considering the objective of the analysis, reviewing suitable options, and working through interpretation. Techniques include grouping, summarizing, finding patterns, discovering relationships, and developing and testing relationships. The aim of this paper is to give an overview of the methodological contribution in multidimensional categorical data analysis based on correspondence analysis, which enables the analysis of a contingency table when the behaviour of one variable is supposed to be dependent on the other cross-classified variable. The analytical procedures gave statistically valid and significantly similar results for the geometrical relationships between different attributes observed in the Almancor migmatites (Évora High-Grade Metamorphic Terrains, Portugal)—leucogranitoid veins, boudins/rock fragments, folds, shear planes, and host rock/diatexite layering. The interpretation of the obtained results allowed the definition of two main geological implications. First, the association of the host rock/diatexite with the leucogranitoids I defines the compositional layering of these migmatites (with 290°–310°-trending). Secondly, the shearing is responsible for the observed structural complexity. Here leucogranitoids tend to occur associated

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