Geostatistical Predictions Based on Data with Hierarchical Structures

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Abstract

When investigating underground geological structures, basic and direct data are boring data. But these are both costly and time-consuming. Cheaper but less exact global data can be obtained using electromagnetic waves. Researchers can detect specific resistance values by observing the reflections of electromagnetic waves transmitted from the surface of the earth or airplanes. Therefore, as to specific resistance values, we can observe three kinds of data, which are one-, two-, and three-dimensional ones respectively and become less exact in that order. We propose two new models which can synthesize these data, which have hierarchical structures, and also propose corresponding geostatistical predictors. Simulation studies are given here to show the effectiveness of proposed methods.

Key words: collocated cokriging, filtering kriging, geostatistics, hierarchical data, multi-step kriging, specific resistance value data

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