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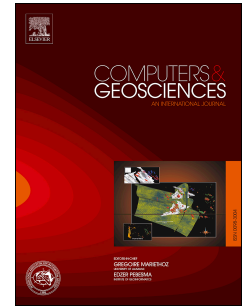
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1 **Identification of geochemical anomalies through combined sequential Gaussian simulation and**
2 **grid-based local singularity analysis¹**

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7 **Abstract**

8 Local singularity analysis (LSA) has been proven to be an effective tool for identifying weak
9 geochemical anomalies. The common practice of grid-based LSA is to firstly interpolate irregularly
10 distributed observations onto a raster map by using either kriging or inverse distance weighting (IDW).
11 The inherent nature of the weighted moving averaging of these methods typically subjects the
12 interpolated map to a smoothing effect. Additionally, the traditional procedure did not allow for
13 uncertainties on the values of geochemical attributes at unsampled locations. As such, these two
14 aspects might affect LSA results. This paper presents a hybrid method, which combines sequential
15 Gaussian simulation and grid-based LSA to identify geochemical anomalies. A case study of
16 processing soil samples collected from the Jilinbaolige district, Inner Mongolia, China, further
17 illustrates the hybrid method and helps compare the results with those from kriging-based LSA. The
18 findings indicate that (1) the uncertainties of values at unsampled locations could affect the results of
19 grid-based LSA, and (2) singularity exponents from kriging-based LSA roughly represent the trend
20 (median) of singularity exponent distributions from simulation-based LSA, but the latter can also

The contribution of each author: J. Wang processed geochemical data. R. Zuo provided the idea of processing data. J. Wang and R. Zuo wrote this paper.

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