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GIS-based prospectivity-mapping based on geochemical multivariate analysis technology: A case study of MVT Pb–Zn deposits in the Huanyuan-Fenghuang district, northwestern Hunan Province, China

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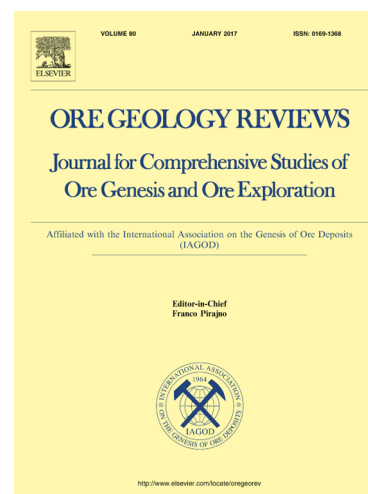
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**GIS-based prospectivity-mapping based on geochemical multivariate analysis technology: A case study of MVT Pb–Zn deposits in the Huanyuan-Fenghuang district, northwestern Hunan Province, China<sup>1</sup>**

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**Abstract**

This paper demonstrates a partial least-squares regression (PLS) method for geochemical modelling, and then uses the models and geological favourable features to obtain mineral potential maps. The PLS is one of multivariate analysis technologies, which can identify variations in associations and correlations among geochemical elements and mineralisation. The method is here used to calculate principal components as well as to identify correlations between Pb-Zn (mineralization) and 25 stream sediment elements for constructing geochemical models in the Huayuan-Fenghuang district of northwestern Hunan Province, China. The models showing the distribution of geochemical anomaly are useful in interpreting the distribution of faults and the Cambrian Qingxudong Formation (ore-bearing formation), and to better define the architecture on mineralisation in the study area. In addition, the models and other favourable features (proxies) are easily integrated into single possibility map by Boost Weights-of-Evidence (Boost WofE) approach for targets.

**Keywords:** Mineral potential maps; Partial least squares regression; Singularity mapping; Boost Weights-of-Evidence; Mineral systems

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