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Geochemistry, the new geophysics?

Minerals keynote paper

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SUMMARY

Both geochemical and geophysical responses of earth materials are governed by mineralogy. It should therefore come as no surprise that geochemical and geophysical patterns are strongly correlated. Using a strong acid digest and a combined ICP MS/AES analytical package, we can now analyse half of the periodic table with very low detection limits, for around the same real dollar cost that Au plus base metals would have cost 30 years ago. With the new analysis methods, we can classify rock types, quantify the intensity of alteration, as well as map pathfinder metals. Integrating chemistry with geophysical data adds a new level of understanding to the meaning of the geophysical patterns. An example from Zambia shows a district-scale alteration map. Correlation with airborne radiometrics and magnetics allows interpolation between sample points, and extrapolation across a whole province. The hydrology of an entire sedimentary basin can be mapped from the combination of data.