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Quantitative Analysis of Tin- and Tungsten-Bearing Sheeted Vein Systems

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Abstract

Several methods are investigated for the quantitative analysis of a range of Sn-W sheeted vein systems from southwest England and Spain. The methods are based on fractal concepts and include the measurement of vein thickness and spacing distributions, and the development of a multifractal interval-counting method, equivalent to box counting in two dimensions. The results indicate that sets of subparallel veins are generally distributed randomly or with only slight clustering, and develop from fracture systems in which the spacing of veins is homogeneous. The opening of the veins is much more heterogeneous, suggesting localization of subsequent deformation and flow. This is especially true in mineralized areas and, together with power-law distributions of vein thickness, can be used to characterize mineralized systems.

New data presented in this paper suggest that fracture evolution may play a fundamental role in defining the location and style of Sn-W mineralization observed. Greisen-dominated and disseminated Sn-W systems develop where the initial fracture system dominates the fluid flow regime, whereas sheeted vein systems are best developed where stress-induced critical behavior of flow in fracture networks controls the permeability and fluid flow of the system.

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