Scale-Free Networks: A model for Regional Seismic Systems?

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ABSTRACT

Scale-free networks are a recently developed approach to modelling the interactions found in complex natural and man-made systems. Such networks exhibit a power-law distribution of link/node frequencies. Tectonic systems also are known to yield power-law distributions of properties such as earthquake magnitude, fault trace length and fault displacement. This paper investigates whether the faults and intervening rock masses of a tectonic system could be modelled as a scale-free network. Such a network-based abstraction would provide a means of representing regions of the lithosphere with potential for novel methods of analyzing seismic stresses and related events, perhaps leading to improved earthquake hazard prediction.

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