EVIDENCE FOR A FRACTAL CRACK STRUCTURE BENEATH CENTRAL GERMANY DERIVED FROM STATISTICAL EVALUATIONS OF RANDOM RESISTOR NETWORKS

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Several electro-magnetic field measurements in the past found highly conductive and laterally anisotropic layers within the earths crust. Random resistor networks representing cracks filled with conductive material and surrounded by a low conductive rock matrix are now more widely used to explain these conductivity anomalies. Correspondence between measured and modelled data is reached under the assumption that these networks stay close to a percolation threshold and hence show a fractal structure. As a consequence of percolation theory statistical properties of the electric field within these networks can be scaled up and compared with electric field observations within an array field measurement. This statistical approach has been applied to array field measurements in central germany where a high conductive layer has been found by Leibecker et al (2002). Results provide new evidence for a fractal crack structure beneath central germany.