A WAVELET BASED TECHNIQUE APPLIED TO LOCALISE SOURCES OF SELF POTENTIAL DATA

G. Marquis (1) and P. Sailhac (1) (2)
(1) EOST, Imagerie tectonique, 5, rue René Descartes, 67084 Strasbourg Cedex, France, (2) IPGP, Paris, France.
sailhac@ipgp.jussieu.fr

Active hydrogeological circulation which involves electrical potential variations can be analysed to investigate stress and fluid percolation through porous media. We now consider ancient and more recent methods to characterize the spatial geometry of sources of self-potential data.
Especially, we present a wavelet based technique developed to address the inverse problem of potential fields. We discuss the choice of the wavelet in relation to the Green's function and demonstrate an inverse scheme using synthetic and real data. Thus, we consider the wavelet coefficients, which are the derived fields or analytic signals continued upward at various scales. They are also the correlation coefficients with a series of Green's functions of the Poisson equation that links the sources to the observed fields. The scale corresponds to the depth of homogeneous sources for the Green's functions. Thus the shape of wavelet coefficients allows us to investigate the geometric parameters of the origin of the observed anomalies: i.e. depth, height, dip and azimuth.