Seismoelectric Study Of The Vadose Zone Using Shear Wave Sources

Fabio Zyserman[1,*] and Leonardo Monachesi[1] and Laurence Jouniaux[2] and Luis Guarracino[1]

1 CONICET and Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, Paseo del Bosque s/n, B1900FWA, La Plata, Argentina
2 Institut de Physique du Globe de Strasbourg - UMR 7516, CNRS et Université de Strasbourg, 5 rue René Descartes, 67000 Strasbourg, France
*zyserman@fcaglp.unlp.edu.ar

ABSTRACT

We study seismoelectric conversions generated in the vadose zone, when this region is traversed by a pure SH wave. We assume that the soil is a partially saturated one-dimensional porous media where water flow obeys Richards' equation[1], and we use the van Genuchten[2] constitutive model to compute the water saturation as a function of pressure height. Correspondingly, we extend Pride's formulation[3] as suggested by Warden et al.[4] to deal with the described conditions, introducing two different saturation dependent functions, namely one monotonous[5] and a non monotonous one[6] into the electrokinetic coupling coefficient. We consider different soil textures and analyse how they affect, among other relevant properties, the electrokinetic coupling coefficient and interface responses, and observe that the latter are several order of magnitude stronger than the coseismic signal, contrary to what happens in the P-wave case.

References

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