

Towards water content monitoring in the vadose zone from active seismic

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V_P/V_S or Poisson's ratio classically permit imaging fluids in rocks but this strategy remains underused in near-surface applications, hence in hydrogeophysics. Yet, P-wave refraction tomography and surface-wave dispersion inversion can be combined to produce 2D V_P and V_S sections from a single acquisition set up. This approach recently proved to be efficient in the study of various hydroystems and in the imaging of the Critical Zone. We now suggest its time-lapse application in order to help the monitoring of water content in the vadose zone/aquifer continuum. With both laboratory experiments and field data, we show how the temporal variations of P-wave travel times and surface-wave dispersion are strongly associated to the variations of water content observed locally, thus encouraging to exploit the full wealth of seismic signals in hydrogeophysics.