



Use of continuous measurements of dissolved organic matter fluorescence in groundwater to characterize fast infiltration through an unstable fractured hillslope (Valabres, France)

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Continuous measurements of natural fluorescence of dissolved organic matter (DOM) in groundwater have been used to characterize infiltration through an unstable fractured hillslope at the event time scale. The experimental site has been investigated in the framework of the STABROCK program by a multidisciplinary team (geomechanicists, geophysicists...). Within the gneissic Valabres rockfall area in the southern French Alps, two sites, in the unstable massif and in the collapse area, were continuously monitored for electrical conductivity and for DOM natural fluorescence using a field fluorometer, and analyzed weekly for hydrochemical data. Two main results were found. From a methodological point of view, DOM natural fluorescence was a relevant tracer of fast infiltration in fissured media, knowing that continuous measurements improved the study of infiltration processes at the event time scale. From a hydrogeological point of view, the unstable fractured massif showed delayed dilution phenomena and the collapse areas showed fast and slow infiltration by piston-type flows via more or less open fractures. Consequently, from this conceptual model one may suppose that, unlike the collapse zones, the fractured hillslope threatening the valley is not submitted to strong pore-water pressure variations.