



A coupled 3-D numerical soil-root water flow model

M. Javaux, H. Hardelauf, S. Gopptschalk, J. Vanderborght, H. Vereecken

Institute for Chemistry and Dynamics of the Geosphere, Forschungszentrum Juelich GmbH

At small scale, root water uptake is a dynamic process, which depends on the gradient between soil and root water potential. Root water uptake models often use root length density-dependent sink term profile, implicitly neglecting any effect of the root water potential distribution along roots. In order to investigate the impact of such an assumption on root water uptake profiles, we coupled a root water flow model (Doussan et al., 1998, *Annals of Botany*. 81:213-223), a 3-D soil water flow model (Simunek et al., 1995) and a root growth and uptake model (Somma et al., 1998, *Plant and Soil*. 202:281-293). A sensitivity analysis was also performed to assess the accuracy needed in the plant and soil parameter determination dynamic process, which depends