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A NEW, SIMPLE AND APPLIED MODEL FOR SOIL CAPILLARY-SATURATION RELATIONSHIP

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Abstract

For studying water flow characteristic of unsaturated zone, also analysis of contaminant transport in vadose zone it is required soil capillary saturation relationship model. Because of the above reasons there are Gardner, Haverkamp, Brooks–Corey, Van Genuchten, and others characteristic equations. Each of the above models has its own advantages and disadvantages. The Van Genuchten consistency model has continuous derivatives respect to capillary pressure head. This has privilege of convergence of numerical solution of the partial differential equations governing to unsaturated fluid flow (Richards' equation). The presented model is compared to the Brooks-Corey and Van Genuchten models. It has the property of continuous derivative near saturation also requires simpler analysis and uses less parameters respect to the Van Genuchten model. In the new model the bubbling pressure head λ and curve fitting parameter α have been used.

Keywords: bubbling pressure - capillary pressure - groundwater - saturation - unsaturated zone - vadose zone