

Interactive comment on “Variable Saturation Infiltration Model for Highly Vegetated Regions” **by James Polsinelli and M. Levent Kavvas**

Anonymous Referee #2

Received and published: 24 April 2016

This manuscript describes an infiltration model in 1 dimensional column that is similar to the Green-Ampt approximation. Such a practical deterministic model for a 1 dimensional uniform porous media for an equilibrium condition may not be new. Then, the Monte-Carlo simulation was used to analyze the horizontal hydraulic conductivity variability. I would classify this model as another extended/modified GA model, rather than a new water infiltration model. This study neglected the vertical soil variability while it is highly arguable. The assumptions used in this work should be clearly stated in the article. Meanwhile, it may be an interesting opinion that the stochasticity of the rainfall pattern essentially controls the heterogeneity of the infiltration in highly permeable watershed. This manuscript did not effectively emphasize this opinion in the argument. In general, the explanations or justifications for the proposed methodology seem to be weak. For example, no justification for the stochastic modeling (fractional Browning

C1

modeling) was provided. The parameters (for example, Hurst number = 0.3, 0.5, 0.7) were not justified either. There is no validation with any field data. Only one model comparison against the numerical solution of 1D Richards equation was provided under one simplistic condition with a constant water supply. This may be the weakest point of this manuscript. Also, the title indicates the effect of vegetation while no plant water intake component was discussed at all. The authors may consider either changing the title or adding the vegetation component. Format and readability is below expectation as a publication ready manuscript. The coherence of the text and figures should be improved. Therefore, I would recommend major revisions for this manuscript.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-75, 2016.

C2