**Hydrology and
Earth System
Sciences
Discussions**

Interactive comment on "Assessment of water penetration problem in unsaturated soils" by A. Barari et al.

Anonymous Referee #1

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This is a potentially interesting work demonstrating two new analytical solutions to the vertical infiltration problem of hydrology.

Firstly, the text has to be proofread by a native English speaker.

There are several typos in the text, the authors should make sure that they are eliminated in the future. There is also a typo in Eq. (5)!

My core problems with the paper are as follows:

1) What is the benefit of the two solutions demonstrated over other, already existing solutions? I do not see any clear advantage of the proposed methods over 'classical' ones. This should be clearly and lucently demonstrated. Such a demonstration is completely missing.

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2) Why should we select K as theta squarred and divided by two, as well as cubed and divided by 3. What is the physical basis of such a prescription? What are the consequences, limitations? Not one word is devoted to such an explanation. Is it physically feasable at all? Is it a realistic soil then? This MUST be discussed in detail!

3) In Figs 1 and 2, how can z have positive and negative values as well? What is z here? What is the datum for z? Must be explained.

I recommend the paper for publication once these concerns have been properly dealt with.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 3811, 2009.