

Interactive comment on “Governing equations of transient soil water flow and soil water flux in multi – dimensional fractional anisotropic media and fractional time” by M. L. Kavvas et al.

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The present paper derived the continuity and motion equations in fractional time-space for unsaturated soil water. The deriving process is concise and convincing. It is very impressive that by simply replacing the original Taylor series to the fractional Taylor series in the deriving process, a dimensionally consistent fractional govern equations can be developed. Besides the new fractional govern equations is consistent with the fractional power number in the formulation of the diffusion coefficient very well. And the deriving process seems to be able to generalize to all similar problems. Thus, I believe the paper is qualified to be published in the journal. However, it would be better if the authors discuss the followings in detail. 1. As the paper mentioned, fractional

C1

differential equation is an important approach to explain the non-Fickian dispersion in transport phenomena. It would be helpful if the authors give some details about whether the new govern equations can simulate the dispersion well or not. 2. The authors suggested that some former work had been done in the same topic like He(1998), but He's govern equation is not dimensionally-consistent. It would be interesting if the authors explain the difference between their work and He's, and how they solve the dimensionally-consistent problem.

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C2