

This manuscript provides a performance assessment of different known algorithms to solve the Richard's equation. In particular, the authors investigate the performance of the Ross method versus the Newton-Raphson with different time-stepping strategies. A nice set of guidelines are provided in the end. The article is well written and provides a nice contribution in this area. Based on this, I suggest the publication of the manuscript after minor revision is addressed to tackle this points:

Minor comments:

- The author should clearly state the assumptions in Equation (1), rigid solid matrix (negligible changes in porosity) but also need to say that $\frac{1}{\rho} \nabla \rho \approx 0$. In this context, it is worth mention that the specific storage coefficient used in Equation (1) is not exactly the same as the specific storage coefficient of the flow equation. The specific storage coefficient is the sum of compressibility of water and soil. In equation (1) the changes in porosity are neglected and therefore "so" is not exactly the specific storage. Only the part corresponding to the compressibility of water.
- Line 36: actually there are three standard forms of the equation: pressure, saturation and mixed
- Equation (13), may be is worth to explain how to calculate fluxes q or simply refer to the appendix here for an example.
- Equation (15), maybe is worth explaining index k
- It is not clear whether the method suggested by Ross (2003) is mathematically equivalent to Newton-Raphson or simply performs the same way in this example. In case it is mathematically equivalent a more detail derivation is required. In case it performs equally in this case the manuscript should clearly state this fact. Could it be that in 2D and 3D the performance of these two algorithms is different?