Meshfree modelling of dynamic consolidation in porous media

Pedro Navas[1*], Susana López-Querol[2], Rena C. Yu[1†] and Bo Li[3]

[1] ETSI de Caminos, C. y P., Universidad de Castilla-La Mancha ,Av. Camilo José Cela S/N, Ciudad Real.
[*] pedro.navas@uclm.es, [†] chengxiang.yu@uclm.es

[2] School of Computing and Technology, University of West London, St Mary Campus,
Villiers House, Heaven Green, Ealing, W5 2NU London, Susana.Lopez-Querol@uwl.ac.uk

[3] Dept. of Mechanical and Aerospace Engineering. Case Western Reserve University, Cleveland (OH) USA
bo.li14@case.edu

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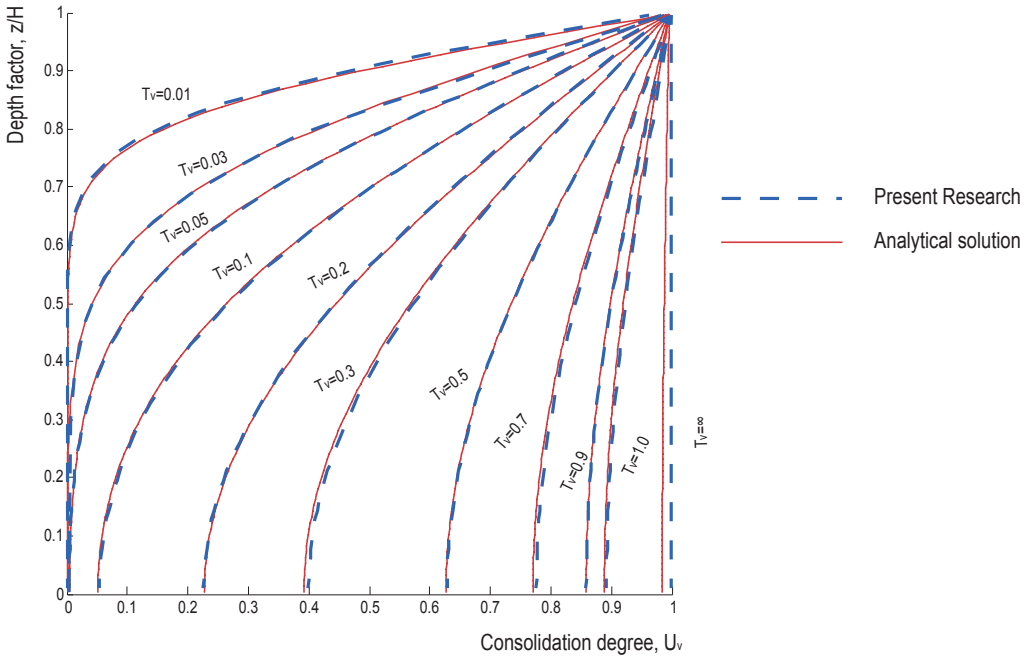
In this work, we establish meshfree numerical schemes based on the principle of Maximum Entropy [1] to solve the dynamic consolidation problem in porous media. The Biot's equations are formulated in the u-w displacement framework [2], the coupling between the solid and fluid phase is carried out through the continuity description of the Biot's equation. The soil mixture is assumed to be elastic, and the influence of its stiffness on the pressure dissipation through porous media is explored. A B-Bar based algorithm is implemented to avoid volume locking in the fluid phase [3]. For validation, the one-dimensional consolidation problem of a vertical soil column is solved and the solution compared with its analytical counterpart (shown in the figure). The methodology is then applied to various consolidation problems and its potentialities are well demonstrated in these examples.



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