Analytical Solution for Thermo-Hydro-Mechanical Analysis of Unsaturated Porous Media Using AG Method

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Abstract : In this paper, a convenient analytical solution for a system of coupled differential equations, derived from thermo-hydro-mechanical analysis of three-phase porous media such as unsaturated soils is developed. This kind of analysis can be used in various fields such as geothermal energy systems and seepage of leachate from buried municipal and domestic waste in geomaterials. Initially, a system of coupled differential equations, including energy, mass, and momentum conservation equations is considered, and an analytical method called AGM is employed to solve the problem. The method is straightforward and comprehensible and can be used to solve various nonlinear partial differential equations (PDEs). Results indicate the accuracy of the applied method for solving nonlinear partial differential equations.
Keywords : AGM, analytical solution, porous media, thermo-hydro-mechanical, unsaturated soils
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