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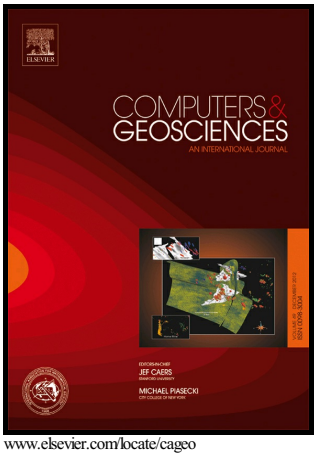

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Numerical simulation of electro-osmotic consolidation coupling non-linear variation of soil parameters

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ABSTRACT

Electro-osmotic consolidation is an effective method for soft ground improvement. A main limitation of previous numerical models on this technique is the ignorance of the non-linear variation of soil parameters. In the present study, a multi-field numerical model is developed with the consideration of the non-linear variation of soil parameters during electro-osmotic consolidation process. The numerical simulations on an axisymmetric model indicated that the non-linear variation of soil parameters showed remarkable impact on the development of the excess pore water pressure and degree of consolidation. A field experiment with complex geometry, boundary conditions, electrode configuration and voltage application was further simulated with the developed numerical model. The comparison between field and numerical data indicated that the coupling of the non-linear variation of soil parameters gave more reasonable results. The developed numerical model is capable to analyze engineering cases with complex operating conditions.

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