A HOMOTOPY-PERTURBATION ANALYSIS OF THE NON-LINEAR CONTAMINANT TRANSPORT PROBLEM IN ONE DIMENSION WITH AN INITIAL CONTINUOUS POINT SOURCE

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Abstract

In this paper, a Homotopy-perturbation analysis of a non –linear contaminant flow equation with an initial continuous point source is provided. The equation is characterized by advection, diffusion and adsorption. We assume that the adsorption term is modeled by Freudlich Isotherm. We provide an approximation of this equation using homotopy-perturbation transformation and solve the resulting linear equations analytically by homotopy-perturbation method. Graphs are plotted using the solution obtained from the method and the results are presented, discussed and interpreted. The research findings show that the concentration increases with time and decreases as distance increases.

Keywords: Homotopy-perturbation, contaminant, advection, diffusion, adsorption

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