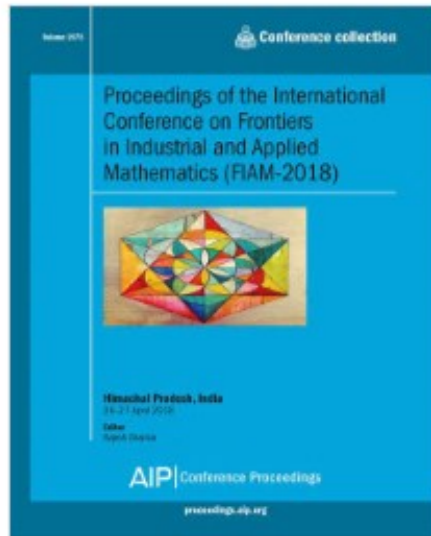**PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON FRONTIERS IN INDUSTRIAL AND APPLIED MATHEMATICS (FIAM-2018)**
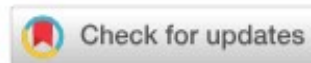
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An efficient technique for solution of linear and nonlinear diffusion-dispersion models 🛒

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➕ Author & Article Information

A numerical technique of orthogonal collocation on finite elements method using quantic Hermite basis is applied to linear and nonlinear diffusion-dispersion models involving fluid flow through porous cylindrical particles. The technique involves partitioning of axial domain into equal elements and then orthogonal collocation method with quintic Hermite as basis function is applied within each element. Effects of different parameters like Peclet number, axial dispersion coefficient, bed porosity etc. on exit solute concentration are presented. Exit concentration profiles are drawn for Peclet numbers ranging from 0 (perfect mixing) to ∞ (perfect displacement). Proposed technique is computationally efficient, stable and yields accurate solution, even for nonlinear stiff problem. The results are found in linear model are in good agreement with exact solution.

Topics