

# Numerical Solution of the General Diffusion Equation Based on the Boundary Element Methods and Chebyshev Approximation

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A combination of the Boundary Element Methods (BEM) and Chebyshev approximation is applied to the three dimensional Dirichlet boundary value problem for the general diffusion equation with variable matrix-valued coefficient. The advantages of both methods lead to an iterative procedure which converges independently of the discretisation parameters. The volume mesh is avoided, only a BEM surface discretisation and the tensor product Chebyshev mesh are used. Some numerical examples illustrate the efficiency of this combination of two numerical methods on hand of some analytically known solutions as well as FEM reference solutions.

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