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A Simple Finite Element Method for Glioma Tumor Growth Model with Density Dependent Diffusion

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Abstract : In this presentation, we have performed numerical simulations for a reaction-diffusion equation with various nonlinear density-dependent diffusion operators and proliferation functions. The mathematical model represented by parabolic partial differential equation is considered to study the invasion of gliomas (the most common type of brain tumors) and to describe the growth of cancer cells and response to their treatment. The unknown quantity of the given reaction-diffusion equation is the density of cancer cells and the mathematical model based on the proliferation and migration of glioma cells. A standard Galerkin finite element method is used to perform the numerical simulations of the given model. Finally, important observations on the each of nonlinear diffusion functions and proliferation functions are presented with the help of computational results.

Keywords : glioma invasion, nonlinear diffusion, reaction-diffusion, finite eleament method
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