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Study of the transient and asymptotic diffusive transport in a stratified medium

The paper presents a method for obtaining the characterization of the short, medium and large time evolution of a diffusion - convection process taking place in a stratified medium. The purpose is to prove the mathematical equivalence between the model associated to the non-homogeneous medium, represented by a PDE with coefficients depending on the coordinate increasing along the stratification and a model described by an equivalent PDE with time dependent coefficients, acting in a corresponding homogeneous domain perfectly defined by parameters deduced from the statistical properties of the original medium. The solution of the transient motion as well as the asymptotic behaviour of the process are analytically expressed from the last model.