

Mass transport in tubular structures: asymptotic analysis and numerical modeling

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Abstract

The flow in a thin tubular structure is considered. The velocity of the flow stands for a coefficient in the diffusion-convection equation set in the thin structure. An asymptotic expansion of solution is constructed. This expansion is used further for justification of an asymptotic domain decomposition strategy essentially reducing the memory and the time of the code. A numerical solution obtained by this strategy is compared to the numerical solution obtained by a direct FEM computation.