

# Scalar transport around a solid sphere falling in a stratified fluid

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## ABSTRACT

In this work we study the dispersion of a passive scalar around a solid sphere falling in a stratified fluid. This problem is important in the understanding of mixing processes in stratified flows. It is solved by a system of differential equations composed of Stokes equation to obtain the velocities and pressure fields and an unsteady convective transport equation for the density field. We use stabilized finite element methods to solve numerically the mathematical model. We present accurate numerical calculations to produce high resolution approximation of the density field in order to represent the scaling of the layer forming around the sphere and in the wake. The numerical results are compared with the theoretical ones.