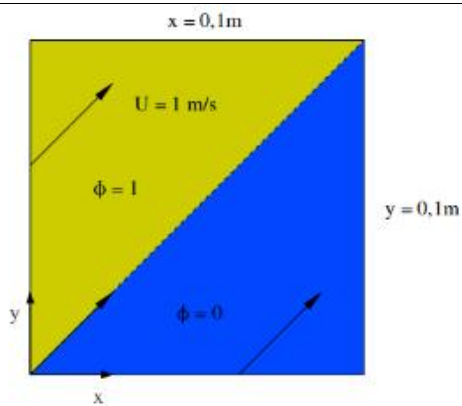


Support to Safety Analysis of Hydrogen and Fuel Cell Technologies

Verification type	Code Verification
Database reference	CV-4
Topic / Application	Code verification Structured Grids Unstructured Grids
Physics	Numerical Diffusion Flux terms.
Summary	This set of verification tests explore numerical diffusion in OpenFoam operators on various grids (structured and unstructured)
Description	This is an online dataset with a set of downloadable OpenFoam cases exploring numerical diffusion. The cases comprise convecting a step function through a domain, with cases varying orientation of grid, cell size, and grid topology. A large number of numerical schemes are also studied.
Case Title	OpenFoam Numerical Schemes
Authors	Tobias Holzmann
Year	2016
Online reference	http://www.holzmann-cfd.de/index.php/en/numerical-schemes
Case image	 <p>The diagram shows a square domain with a diagonal step function. The top-left region is yellow and labeled $\phi = 1$. The bottom-right region is blue and labeled $\phi = 0$. A velocity vector $U = 1 \text{ m/s}$ points from the bottom-left towards the top-right. The domain boundaries are $x = 0, 1\text{m}$ and $y = 0, 1\text{m}$.</p>
Governing equations	$\frac{\partial \rho \phi}{\partial t} + \nabla \cdot (\rho \vec{u} \phi) - \nabla \cdot (D \nabla \phi) = Q_\phi$
Results	