# Natural Convection in a Vertical Channel with fins using conjugate heat transfer solver in OpenFOAM

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# Synopsis

This research migration project aims to simulate a natural convection flow in a vertical channel. A chtMultiRegionSimpleFoam solver is used for numerical simulation of natural convection in a vertical channel with fins, a steady-state solver in OpenFOAM. Square fin and triangle fins are roughness elements in the flow domain. K-epsilon turbulence model is chosen as the turbulence model. For radiation modeling, the fvDOM radiation model is used. This research migration project uses OpenFOAMv2012 software and validated the results from a published paper.
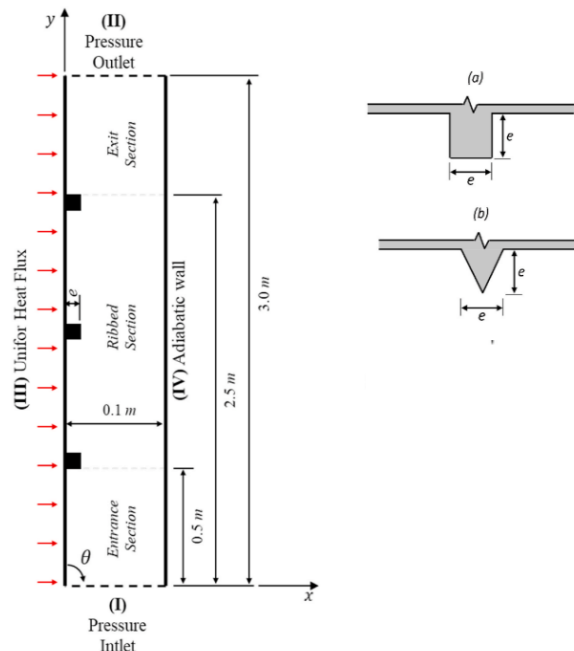


Figure 1: Vertical Channel with different ribs/fins (a) square fins (b) triangle fins

[1]     B. Nghana, F. Tariku, and G. Bitsuamlak, "Numerical assessment of the impact of transverse roughness ribs on the turbulent natural convection in a BIPV air channel," *Build. Environ.*, vol. 217, no. March, p. 109093, 2022, doi: 10.1016/j.buildenv.2022.109093.