Natural Convection in water subjected to Uniform Heat Flux in 3D slab

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Abstract

A fluid(water) is filled in hollow 3D slab, geometric description is given below, bottom surface of slab is maintained uniform heat flux condition with flux magnitude 31.525 kW/m2, while all other five faces are assumed as adiabatic. In Open FOAM v-7, "buoyantBoussinesqPimpleFoam" Solver is merged with "buoyantPimpleFoam", although boussinesq approximation can be applied easily by using the same solver .i.e. buoyantPimpleFoam. It is transient solver deals with natural as well as forced convection for compressible & incompressible fluid flow. k-Epsilon- turbulence model is used solve the above problem.

Geometry & Meshing: Geometry and meshing is done in Gmsh4.4.1 software.

length = 50cm

height = 25cm

width = 12.5cm