Numerical Simulation Melting of Ice using OpenFOAM

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Abstract

This case study demonstrates the melting of ice. It's a example of phase change process. The present case uses a multi-region approach to simulate the phase change process. The simulation is carried out in OpenFOAM v1906 using the solver **chtMultiRegionFoam** and the phase change is handled by **solidficationMeltingSource** source term. The geometry is a 2-D circle and the flow is laminar and transient. The volume fraction of melting water is obtained from the simulation

Problem Statement

The 2D geometry has a 30mm OD and 5mm thickness copper pipe, ice is present in the inner side of the pipe. The outer walls of the copper pipe are maintained at a constant temperature of 25^{o} C. The 2D geometry generated by blocks for hexahedral mesh generation using Salome-Meca is given in the figure below