**INTRODUCTION**

- Heat exchangers optimization using Code_Saturne [1] and SYRTHES open sources codes developed by EDF R&D
- Validation of Code_Saturne/SYRTHES coupling, important in the optimization chain

**DATA FORMATTING**

- Only one pattern: geometrical periodicity
- 2D ribs: one fluid-only case and one fluid-solid case

**RESULTS**

- Fluid-only simulations: turbulence model sensitivity is carried out available in Code_Saturne
- Fluid-solid simulations: EBRSM turbulence model is compared to fluid-only and experimental data

**CASE STUDY: 2D RIBS**

- Experimental data from Wang and Sunden [3, 4]
- Effect of periodic squared ribs on the heat transfer through heated squared canal

**SOURCE TERM**

- The physical periodicity involves: $T_{inlet} = T_{outlet}$ and $\rho_{inlet} = \rho_{outlet}$
- Variable change (for $T$) through a source term adding in Code_Saturne:

$$\frac{\partial}{\partial t}(\rho u_T) = -\frac{\partial (Q_T)}{\partial x} - \rho c_p \frac{\partial T}{\partial x}$$

with

$$\alpha_T = \frac{\dot{q}(L-2l)}{\rho c_p \sum \tilde{u}_{x,i} \Omega_i}$$

**References**


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