**Cooling system for Readout Module Box**

**Simulation Parameters**

**Model**

* + Simple Model A
  + Simple Model B
* Main heat sources
  + Peltier area (26 W)
  + Back heat source area (61W)
* Fluid properties (Water)
  + Flow rate 1 (L/m)
  + Temperature (18 °C)
* Material Properties
  + Aluminium 6061- T651
  + Copper

**Assumptions**

1. Steady state system
2. No fouling
3. No corrosion
4. Resistance in negligible
5. Incompressible fluid without phase changes
6. Tamb constant at (18 °C)

**Expectations**

* The system shall lower the temperatures
  + Uniform across the box but in particular on the:

1) SiPM,

2) CCgM,

3) QIE boards.

* The box shall be thermal neutral (should not vary the temperature of the surroundings components).
* Pressure is 10 bars.
* Structural Analysis

**Possible modification**

* Alternative option to lower the temperature of the box is to replace SiPMs half wave in the HL-LHC run.
* Current model is two plates connected in series. We can test connecting plates in parallel.
* The flow can be adjusted
* Eliminate grooves of the bottom plate.
* Having Copper on the bottom and top plate
* Tubes in parallel with a manyfold