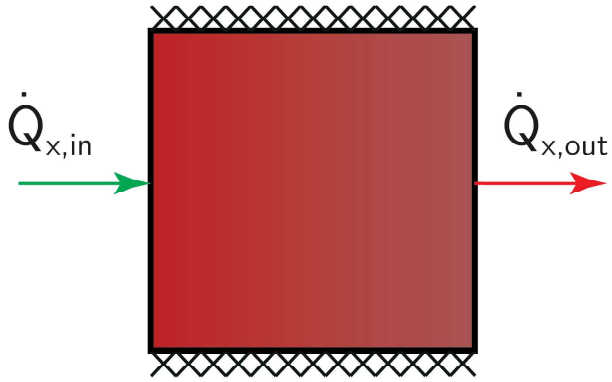
EB - Cond. - Body 1

Set up the energy balance for the cube to determine its temperature T_w. Assume steady-state heat transfer without source/sink inside.



Energy balance:

$$\dot{Q}_{x,in} - \dot{Q}_{x,out} = 0$$

The sum of the in- and outgoing heat fluxes of the control volume should equal zero, because of steady-state conditions.

Heat fluxes:

$$\dot{Q}_{x,in} = \dot{q}'' L^2$$

$$\dot{Q}_{x,out} = \alpha L^2 \left(T_w - T_\infty\right)$$