Homowork: single-phase fluid flow and heat transfer in wavy microchannel heat sink (Wavy microchannel)

Known: Cold water at T_f=20℃ flows into the inlet of a aluminum microchannel with various velocity based on the Reynolds number. The Re considered in this work is ranged from 100 to 1000. The bottom wall of MCHS is heated with a uniform heat flux q = 100W/cm^2.

Assumption: (1) steady state, (2) laminar flow, (3) incompressible fluid, (4) constant fluid properties, (5) negligible radioactive and natural convective heat transfer from the micro channel heat sink.

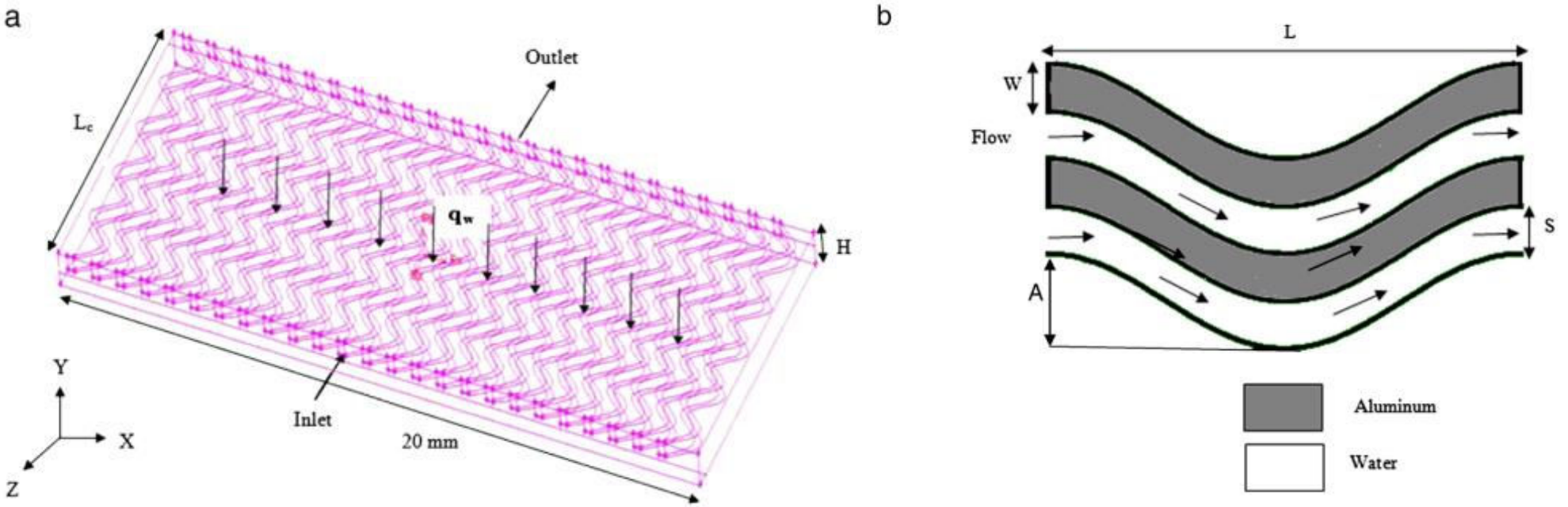

Fig.1 Computational domain

Table .1 Geometrical parameters of microchannel

Geometrical Parameters	D_h	H	W	L	L_c	S
Value/μm	339.15	430	280	2000	10000	500

Question

Effects of different wavy amplitudes, A of the microchannels and the Re (from 100, 200, 400, 600, 800, 1000) on temperature distribution, heat transfer coefficient, pressure drop, *Nu*, and *f*.

$$\alpha = A/L$$

Table .2 Amplitude values of the wavy microchannel

Amplitude, A (μm)	125	250	375	437.5	500
Dimensionless amplitude, α	0.0625	0.125	0.1875	0.21875	0.25

Homework due： ****