Calculations Design Lab - session 3

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Preliminery calculations

Re = u*D/nu = 35*2/10^-5
  = 7,000,000

yp = Y * nu / sqrt(0.5*C*U*U)
  = 50 *10^-5 / sqrt(0.5*0.078*(7000000^-1/4) * 35*35)
  = 0.0005188

expansion ratio

cells = 30, width = 1 *2

therefore, a + ar + arr + ... + ar^29 = 1
a = 2*yp = 2*0.0005188 = 0.001

here r = 1.19
expansion coeff = r^29 = 155.2 for y-axis

Turbulance parameters

turbulant intensity I = 0.16 Re^-1/8
I = 0.16*7000000^-(1/8)
  = 0.0223

Turbulant kinetic energy k = 3/2 * (u*I)^2
k = 0.913

epsilon = C^3/4 * k^1.5 / (0.07*L)

C = 0.09, L =2
epsilon = 0.164*0.913^(1.5) /(0.14)
  = 1.022