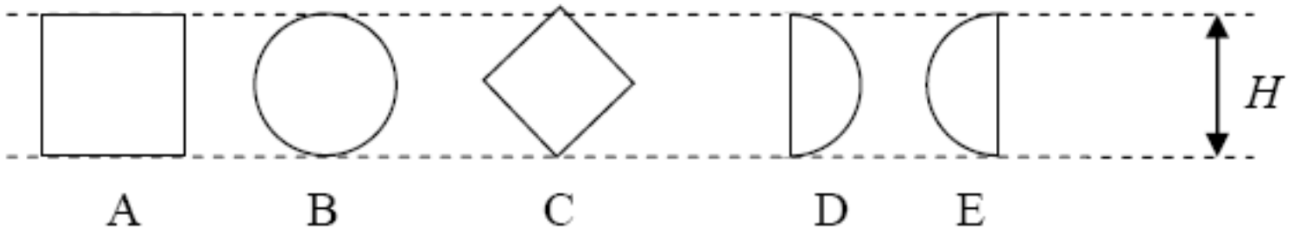
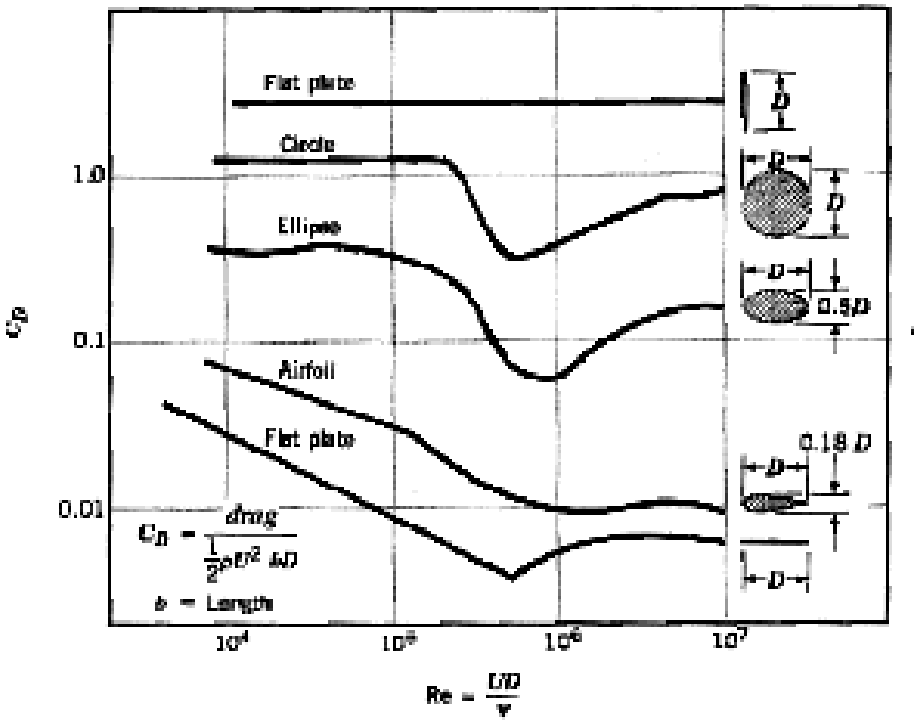
Individual task:

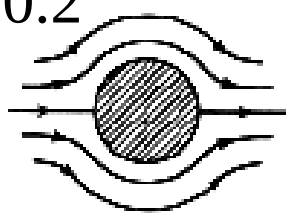
- Drag for a 2D object:



Reynolds no. dependency



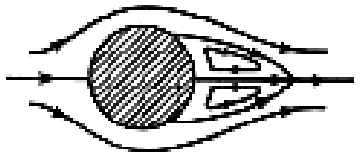
Re=0.2



No separation

(A)

Re=12



Steady separation bubble

(B)

Re=120

Oscillating Karman vortex street wake

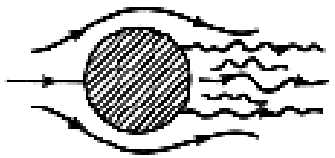
(C)

Re=30.000

Laminar boundary layer
wide turbulent wake

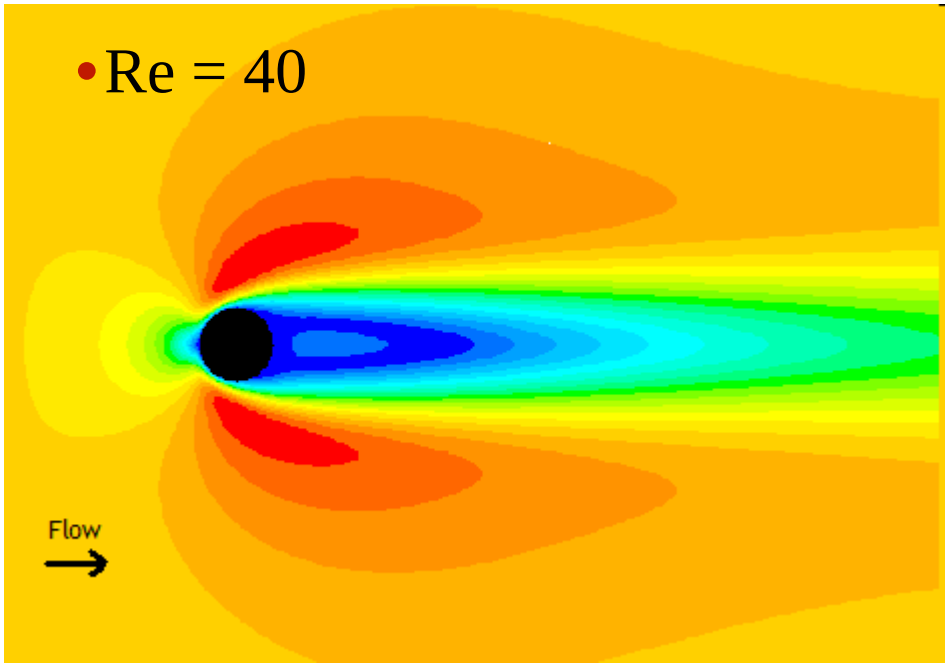
(D)

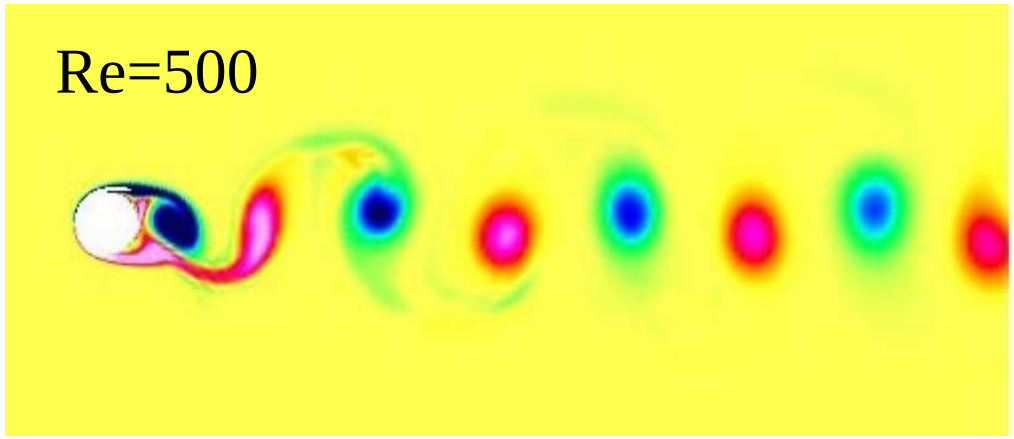
Re=500.000

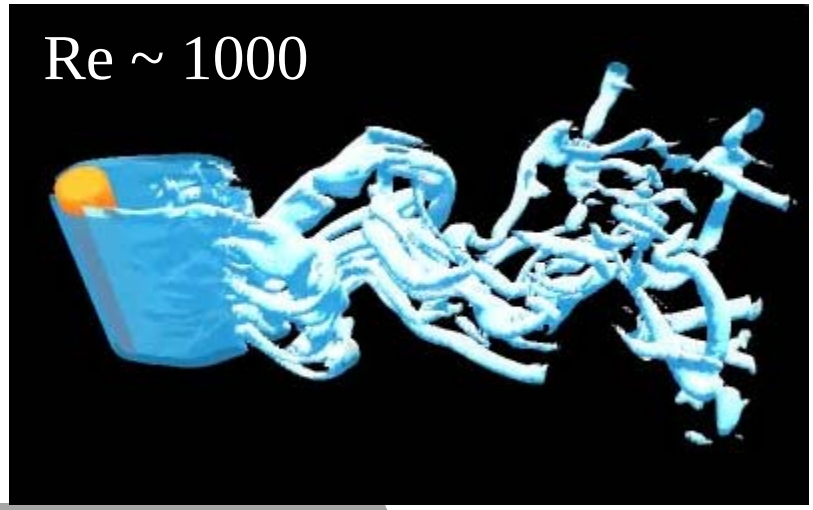


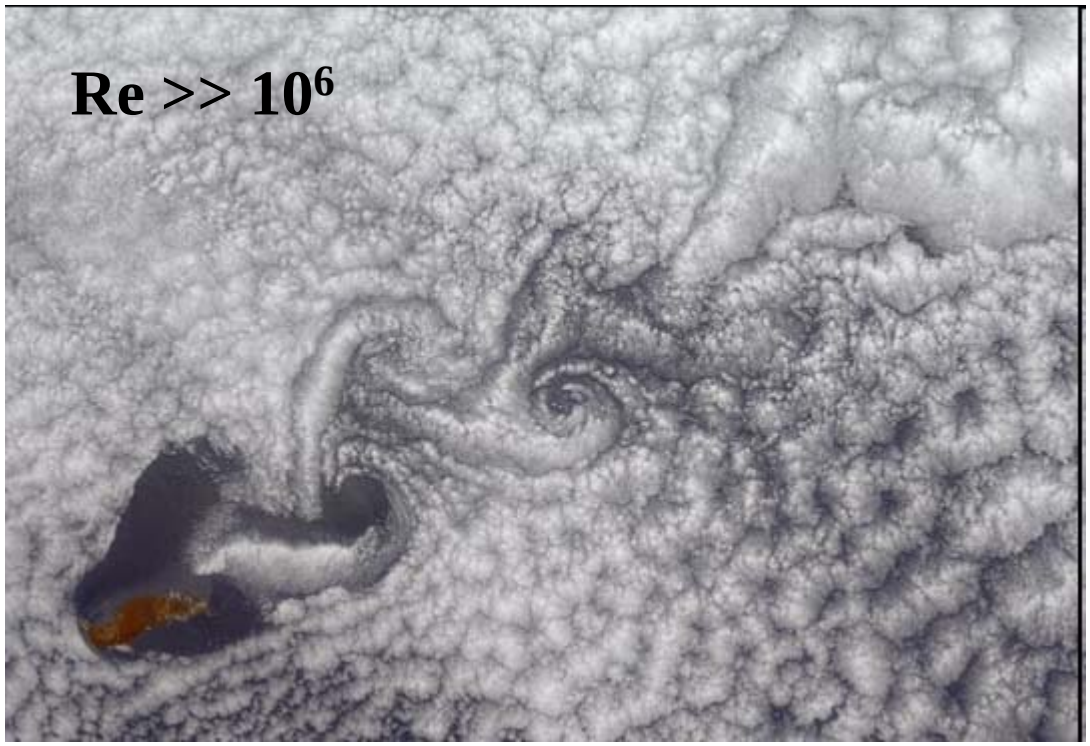
Turbulent boundary layer
narrow turbulent wake

(E)


• Re = 40
Flow


Re=500

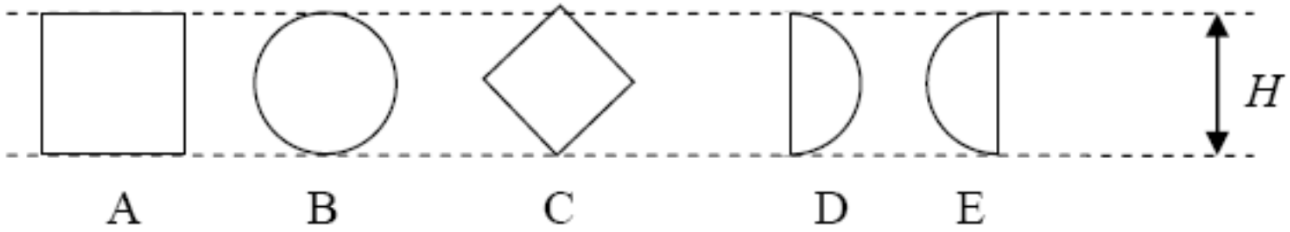

Re ~ 1000


Re >> 10^6

What to do:

- Objective

  To derive the drag coefficient for a 2D object



- Setting
  - Choose object
  - Choose Re=10^4, 10^5 or 10^6
  - Incompressible: Ma<0.1
- Derive
  - Drag coefficient
  - Grid and flow pictures
- Different approximations – no ”correct answer”

When:

- Preparation for lecture 2 (20/3):
  Sketch, Physical model, Reynolds number
- During lecture 2 (20/3):
  Determine the grid resolution requirements
- Before lecture 5 (18/4 12:00):
  Compute the case using Fluent
- During lecture 5 (19/4):
  I will compare the different results – feedback