

Lecture 26

11/30

* Final Exam: Thursday, Dec 9, 12:10-2:00 PM
10% Closed-book

Scope: Comprehensive
* Calculator permitted
* ~~No~~ computer/cellphone/camera

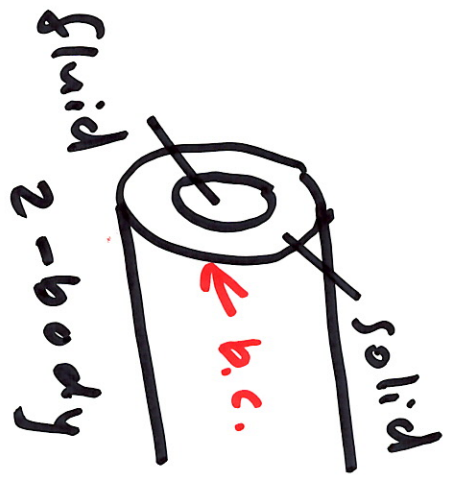
Continuing from Lec 25

Beyond Proj 1-3

* hybrid fluid-solid system

flow, thermal

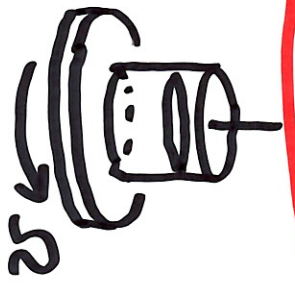
- ☑ Energy Eq.
- ☑ Heat Exchanger



* moving boundary

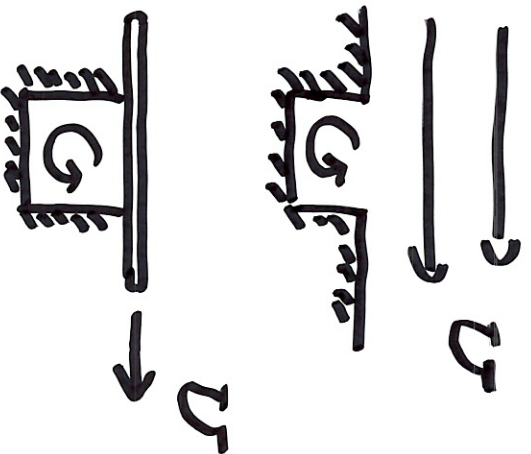
* moving } coordinate

rotating



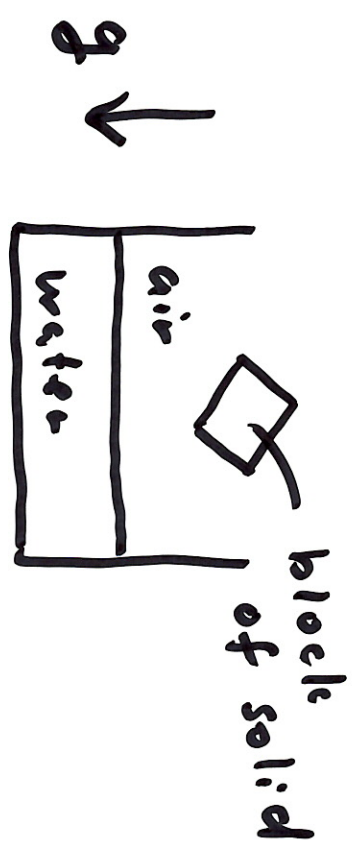
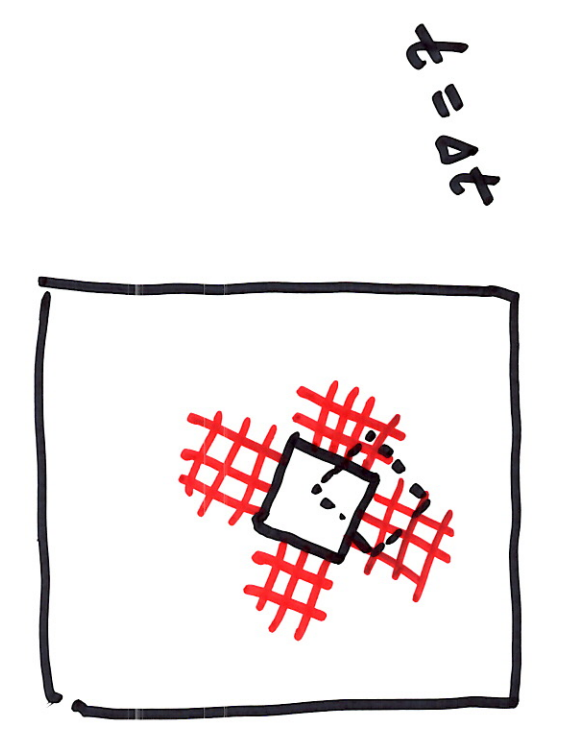
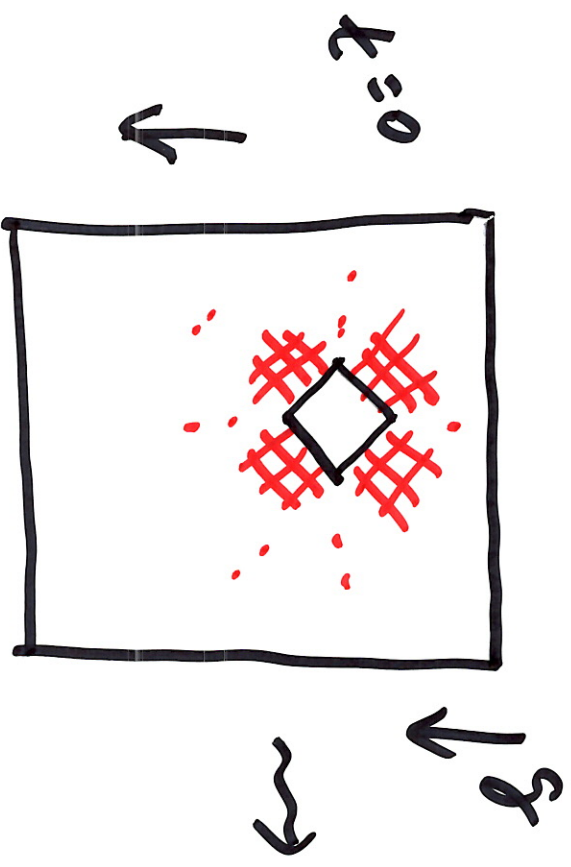
static mesh

adding
Coriolis force
+ Centrifugal force



* Dynamic mesh

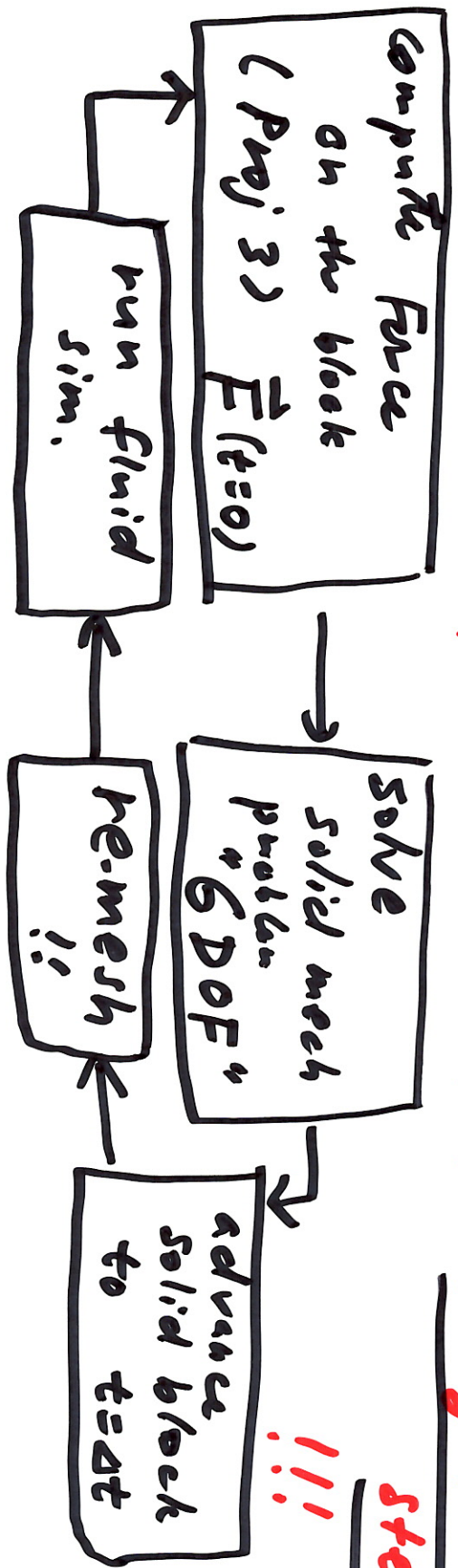
transient



** Need to re-mesh every time*

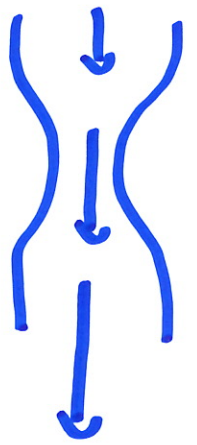
step

!!!



* Compressible flow high Mach *

(except Proj 1 Task 3 (4)?)



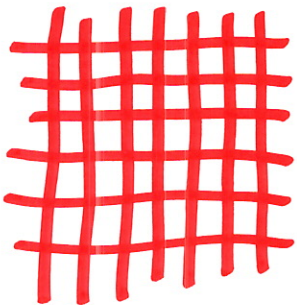
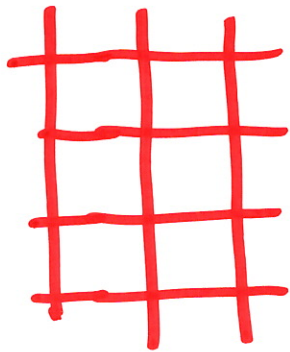
→ Acoustic mode

Numerical schemes, etc.

* Grid convergence very important

but

< 512K elements



etc

Richardson

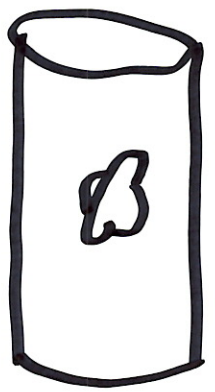
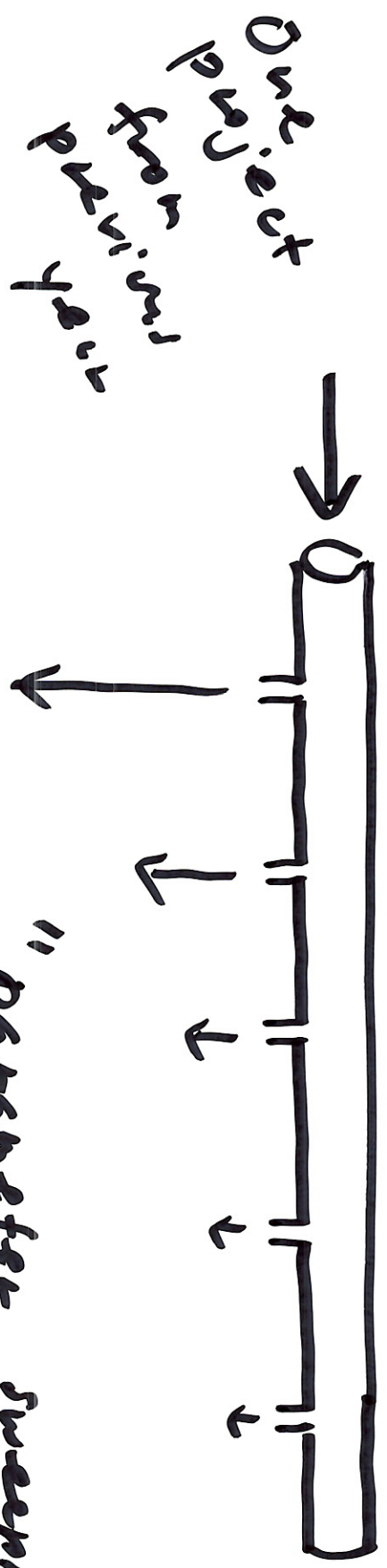
extrapolation
etc.

* ~~the~~ Configuration
of mesh

* Different orders of numerical schemes for governing eqs:

— process —

* Computer-aided design of fluid system



"parameter sweeping"

Ansys (Fluent) :

"Parametric Design"

Beyond Fluent Ansys

CFD solver

\$ { Comsol
Autodesk CFD

Abacus
!

Open source

OpenFOAM (Linux based)

consortium based

WRF

etc

Nek5000

etc.