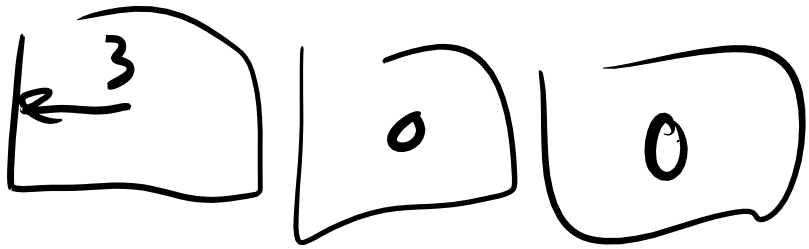
$$A\vec{y} = -A\vec{x}_0$$

$1^2 + 2^2 = 5$



$3^2 = 9$

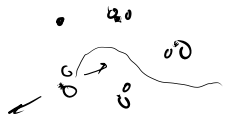
goop

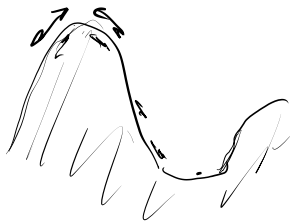
Visco-elastic fluids

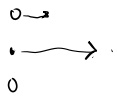
- ✓ Surface tension
- ✓ Viscosity (thick)
- ✓ elasticity / plasticity
  - Stress-thinning
  - Stress-thickening

  ] non-newtonian

(water, honey, (toothpaste), (paint))







fluids

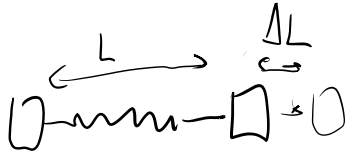
- Cloth
- rope
- Sponge
- muscle/fat
- ⋮

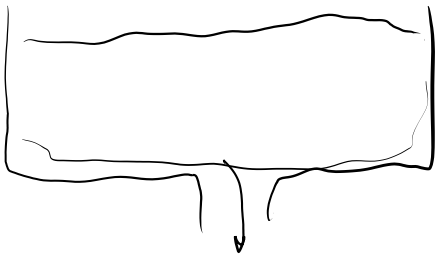
] soft body

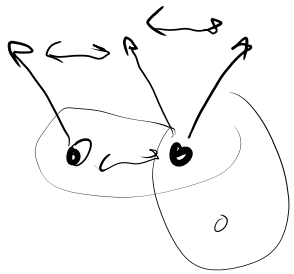
$\frac{\text{Force}}{\text{Area}}$ Stress

$\text{Strain} = \frac{\Delta L}{L}$

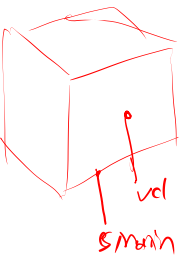
Elastic $\quad \text{Stress} = \propto \text{Strain}$



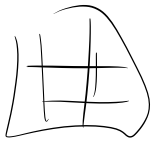


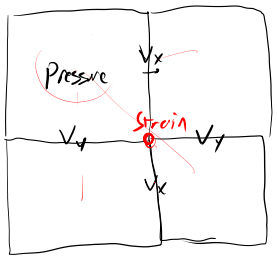


Strain rate



Eulerian



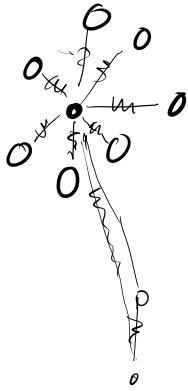


advect
- fluid - density
- velocity - momentum
- Strain

elasticity
- stress from strain

plasticity
- reduce strain

Lagrangian

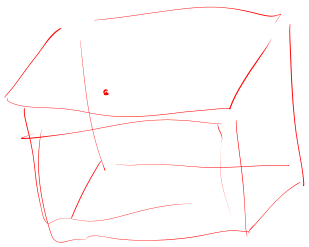


loop:
- compute volume - pressure (pressure)
- update vol
- advect

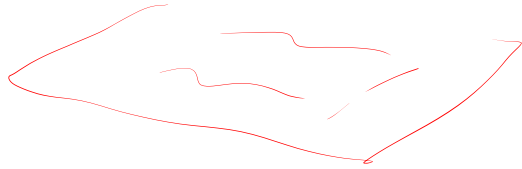
spring
- elasticity
- viscosity
- plastic

chunk spring length

Cube map

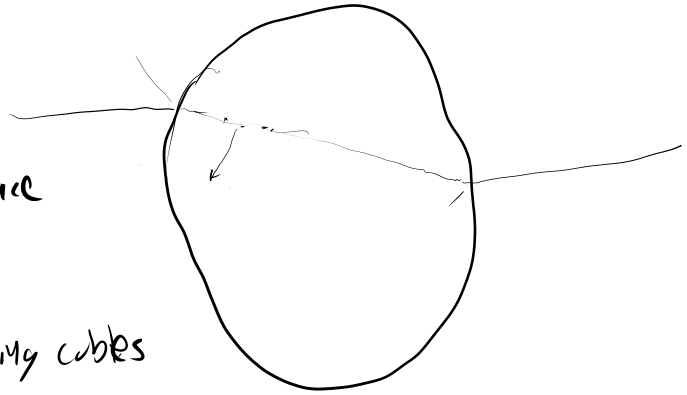


Water



Raytrace

machine cubes



Caustics