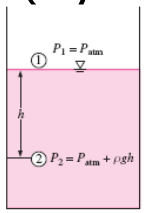
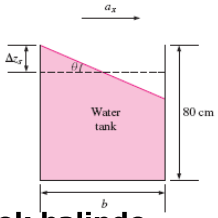
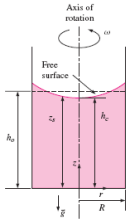
Duran Akışkanlar
(Kayma gerilmesi taşımayan)



Durgun akışkan kütlesi

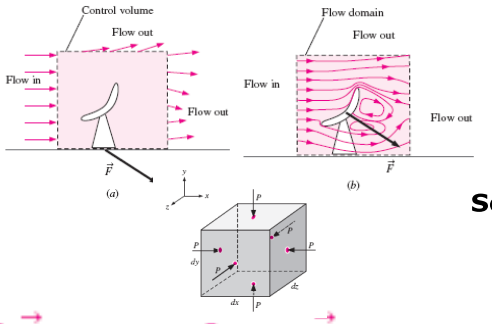


Blok halinde öteleme hareketi



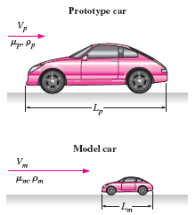
Blok halinde dönme hareketi

Diferansiyel Yaklaşım

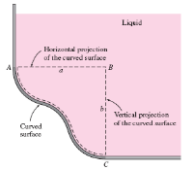


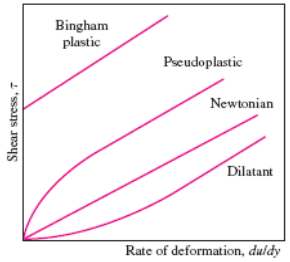
$$\rho\left[\frac{\partial \vec{V}}{\partial t} + (\vec{V}\cdot\vec{\nabla})\vec{V}\right] = \rho\frac{D\vec{V}}{Dt} = \rho\vec{g} + \vec{\nabla}\cdot\sigma_{ij}$$

Deneysel Yöntemler:
Benzeşim
Mıdel Deneyleri



Sonlu Farklar



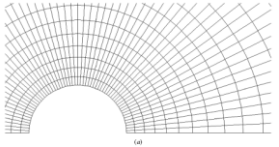


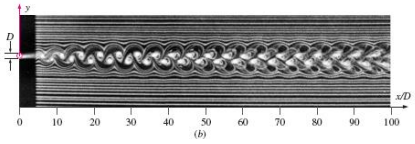
Akışkan Tipleri

(Statik+Dinamik)

AKIŞKANLAR MEKANİĞİ

Sayısal Akışkanlar Dinamiği





Fluent, CFdesing CFX

Sonlu Hacimler

Akışkanın Tanımı (Sürekli ortam)

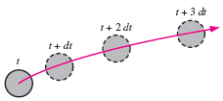
Akışkanların özellikleri:

Yoğunluk, Basınç, Sıcaklık, İç enerji
Entalpi, Entropi, Özgül ısılar

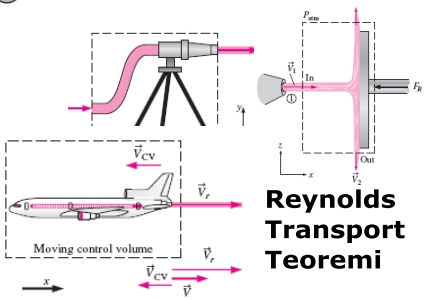
Dinamik viskozite, Isıl iletkenlik

Hacimsel Genleşme, Bağıl yoğunluk
Yüzeysel Gerilme, Buharlaşma basıncı
Ses hızı, Özgül ağırlık, Kinematik Vis.

$$\frac{D}{Dt} = \frac{d}{dt} = \frac{\partial}{\partial t} + (\vec{V}\cdot\vec{\nabla})$$



Hareketi izleyerek alınan türev



Reynolds Transport Teoremi

Denetim Hacmi

t (sistem)

1. $\dot{m} = sabit$

Yerçekimi (g)
Kütle Kuvvetleri

2. $\vec{F} = m.\vec{a}$ veya $\left[\vec{F} = \frac{d}{dt}(m\vec{V})\right]$

Yüzey Kuvvetleri:
Basınç (p) ve
Kayma Gerilmesi (τ)

3. $d\dot{E} = d\dot{Q} - d\dot{W}$

p

τ

t+dt (sistem)

$$\vec{V} = (u, v, w) = u(x, y, z, t)\vec{i} + v(x, y, z, t)\vec{j} + w(x, y, z, t)\vec{k}$$

n

$$\frac{dB_{sys}}{dt} = \frac{d}{dt}\int_{CV}\rho b\,dV + \int_{CS}\rho b\vec{V}\cdot\vec{n}\,dA$$

b=1 Kütlenin Korunumu
b=V Momentum Denk.
b=E Enerji Denklemi