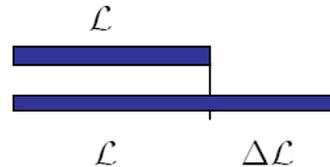


Lecture 16 - summary

Topic: How to measure and describe deformation

Goal is to develop a mathematical language to describe deformation

Definition of strain: $\epsilon = \frac{\Delta \mathcal{L}}{\mathcal{L}}$



Measurement of strain: Electrical, optical, mechanical, acoustical...

Strain gages: Measure deformation based on changes of electrical resistance R

$$\epsilon = \frac{1}{GF} \frac{\Delta R}{R_0}$$

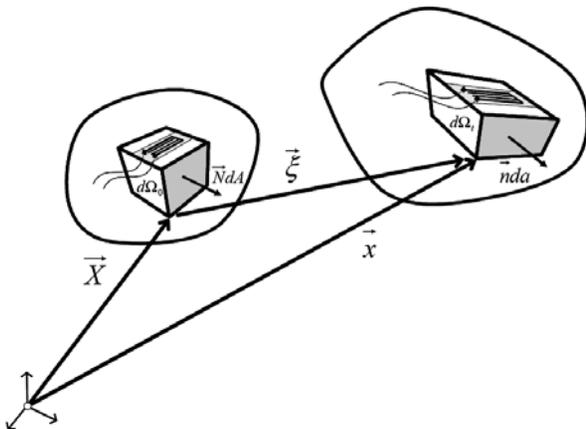
Lectures 1-15
Momentum
conservation



Lectures 20-..
Thermodynamics
Energy balance



Lectures 16-19
Geometrical analysis



\vec{x} Deformed position

\vec{X} Initial position

$\vec{\xi}$ Displacement $\vec{\xi} = \vec{x} - \vec{X}$

$$d\vec{x} = \frac{\partial \vec{x}}{\partial \vec{X}} \cdot d\vec{X} = \underline{\underline{F}} \cdot d\vec{X}$$

$$\underline{\underline{F}} = \underline{\underline{1}} + \text{Grad } \vec{\xi}$$