

Table of content:

- ✓ Introduction
- ✓ Materials and Properties of Polymer Matrix Composites
- ✓ Mechanics of a Lamina
- ✓ Laminate Theory
 - **Ply by Ply Failure Analysis**
 - Externally Bonded FRP Reinforcement for RC Structures: Introduction and Basics
 - Flexural Strengthening
 - Strengthening in Shear
 - Column Confinement
 - FRP Strengthening of Masonry Structures
 - CFRP Strengthening of Metallic Structures
 - FRP Strengthening of Timber Structures
 - Design of Flexural Post-Strengthening of RC: Swiss Code 166
 - Design of FRP Profiles and all FRP Structures
 - An Introduction to FRP Reinforced Concrete
 - Structural Monitoring with Wireless Sensor Networks
 - Composite Manufacturing
 - Testing Methods

Quiz

- A Fiber failure
- B Delamination
- C Matrix crack
- D Debonding



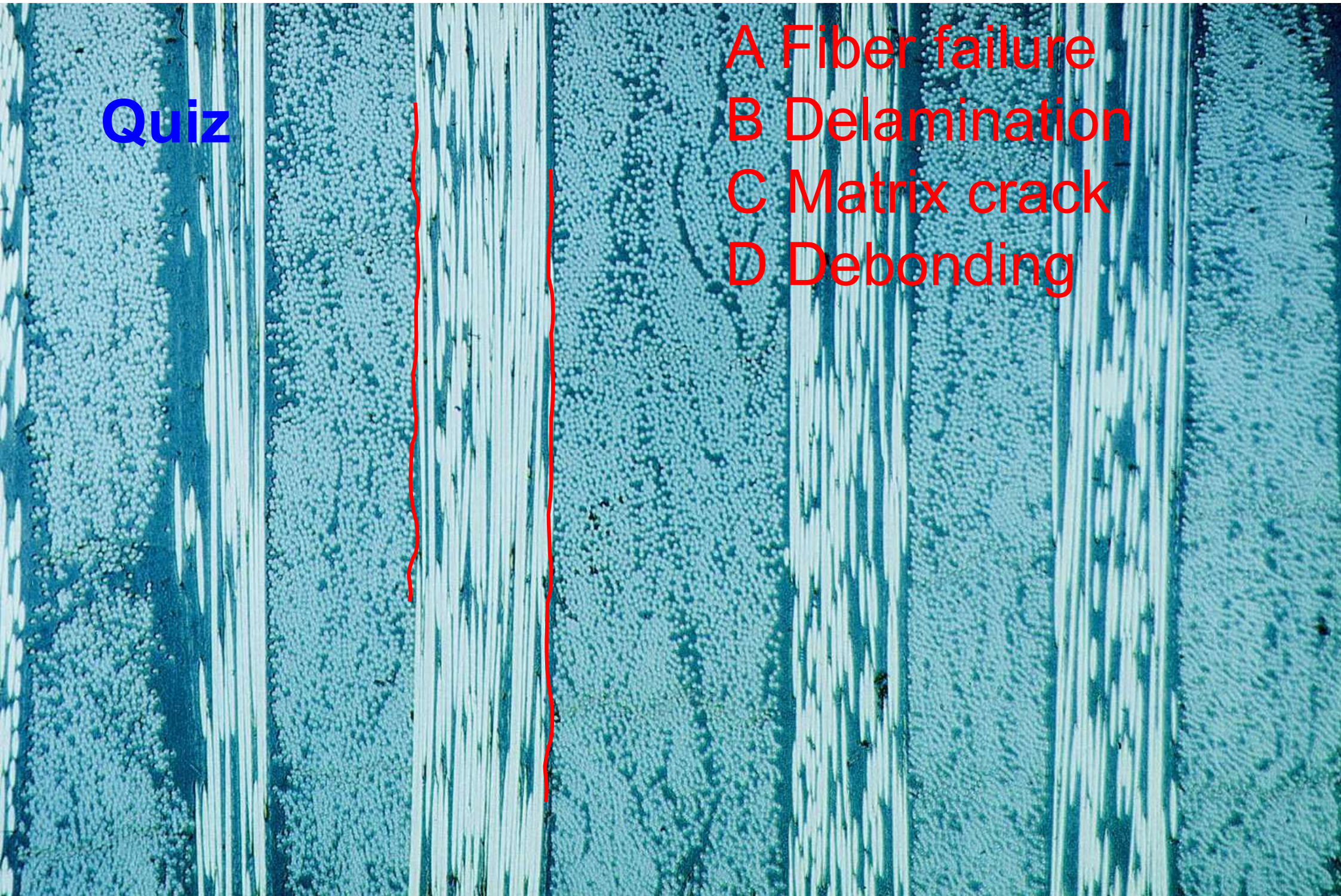
Answer to Quiz

- A Fiber failure
- B Delamination
- C Matrix crack
- D Debonding



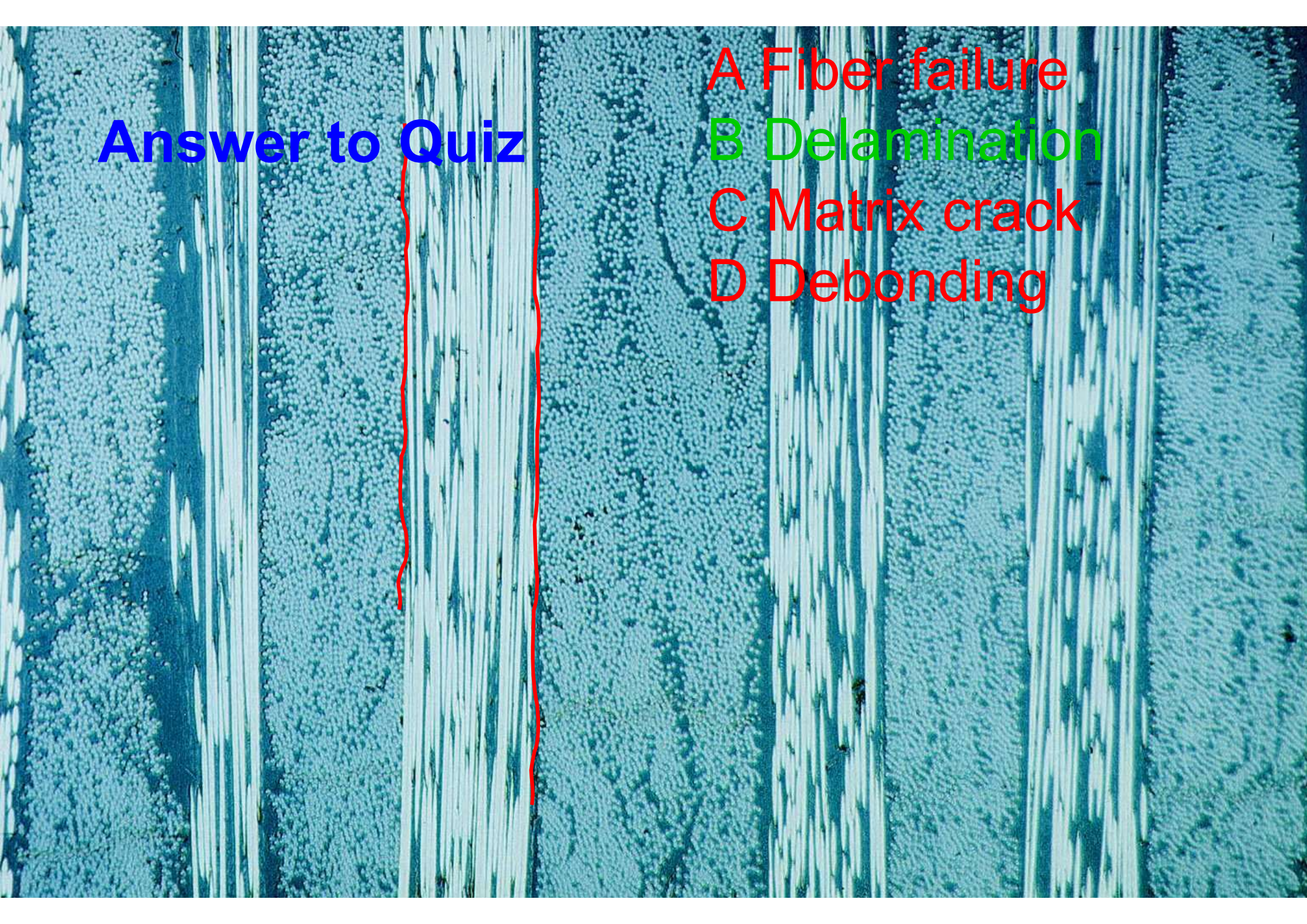
Quiz

- A Fiber failure
- B Delamination
- C Matrix crack
- D Debonding

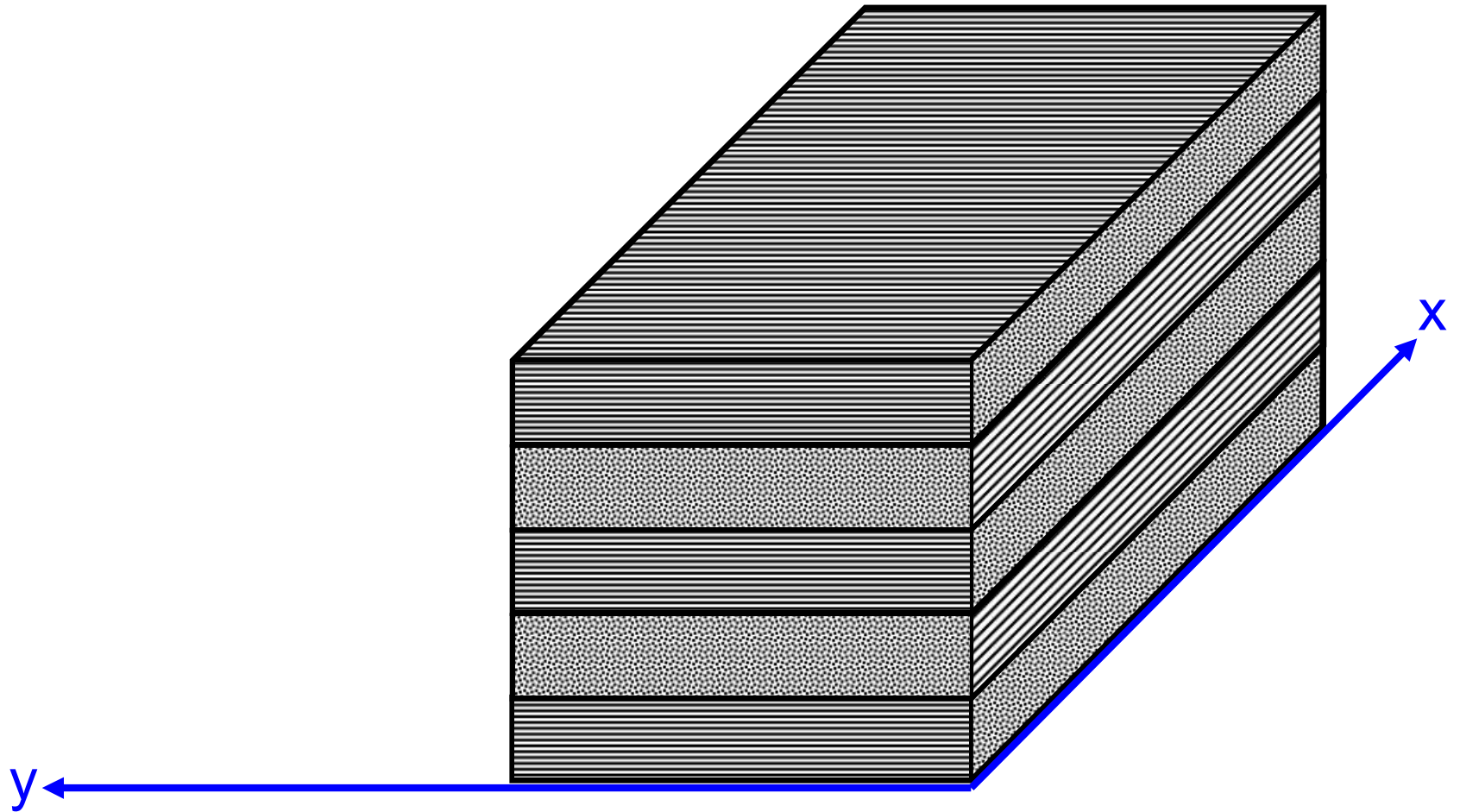


Answer to Quiz

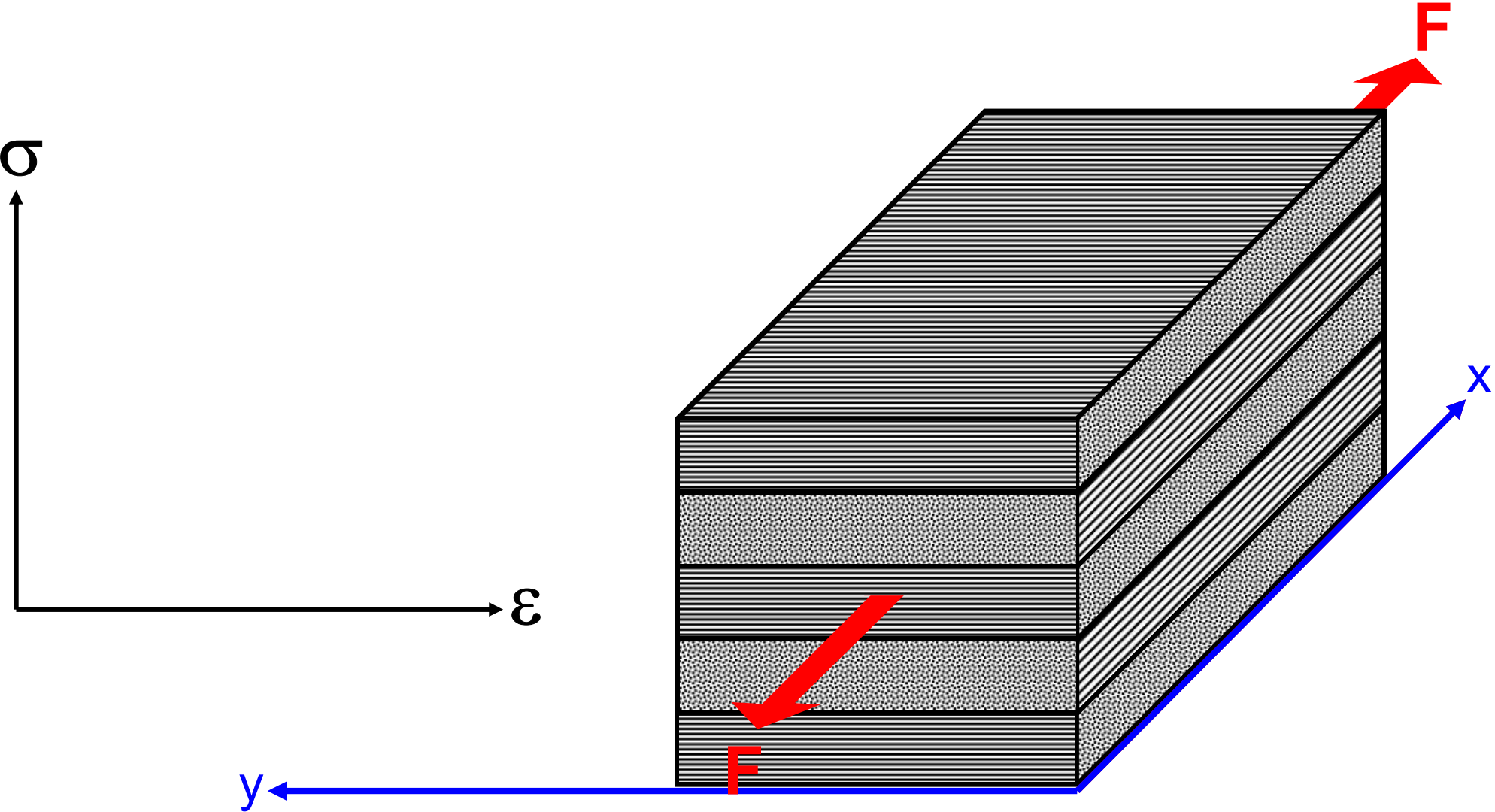
- A Fiber failure
- B Delamination
- C Matrix crack
- D Debonding



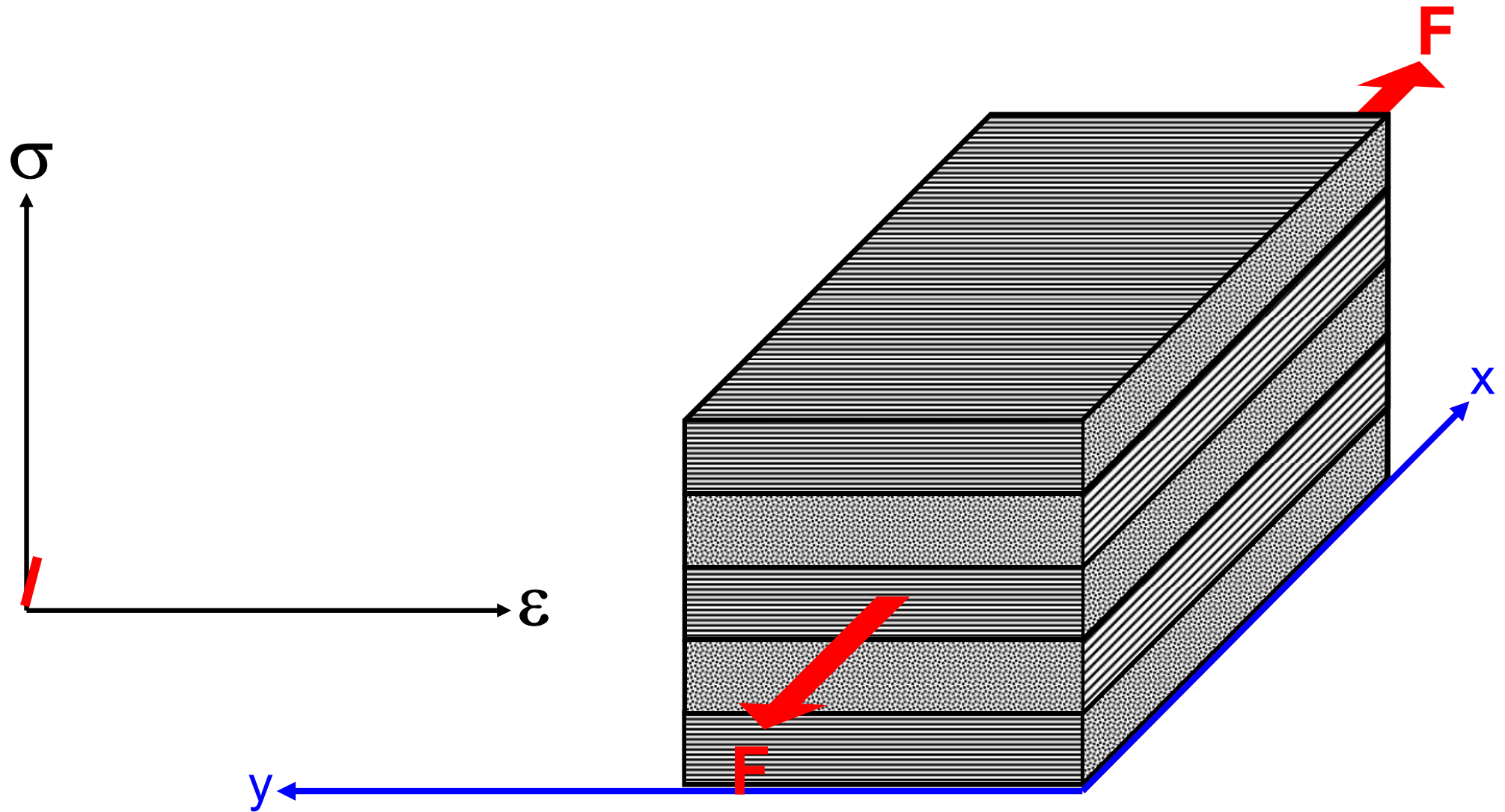
Symmetric Crossply Laminate ($90^\circ/0^\circ/90^\circ/0^\circ/90^\circ$)



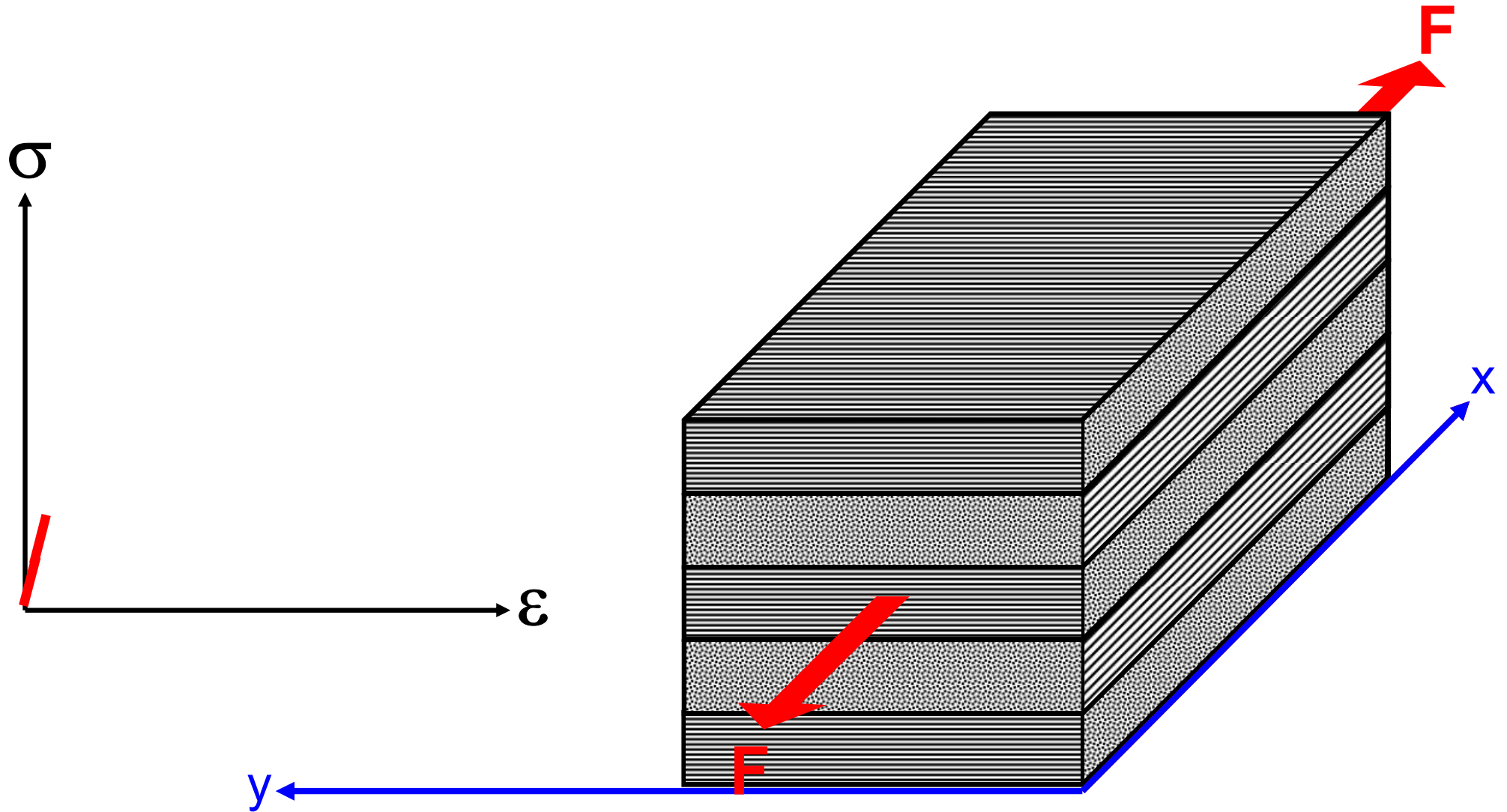
Nonlinear Failure Analysis



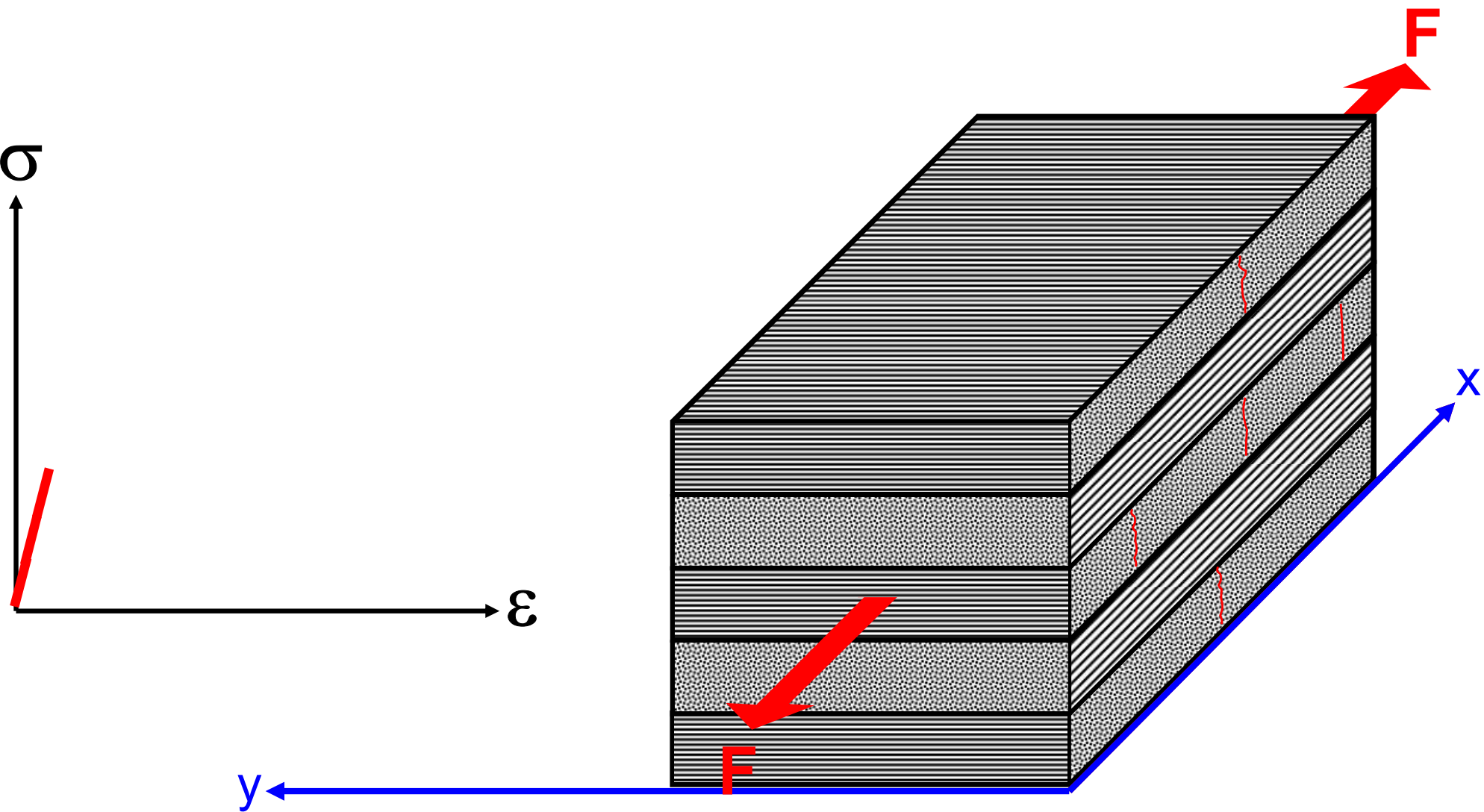
Nonlinear Failure Analysis



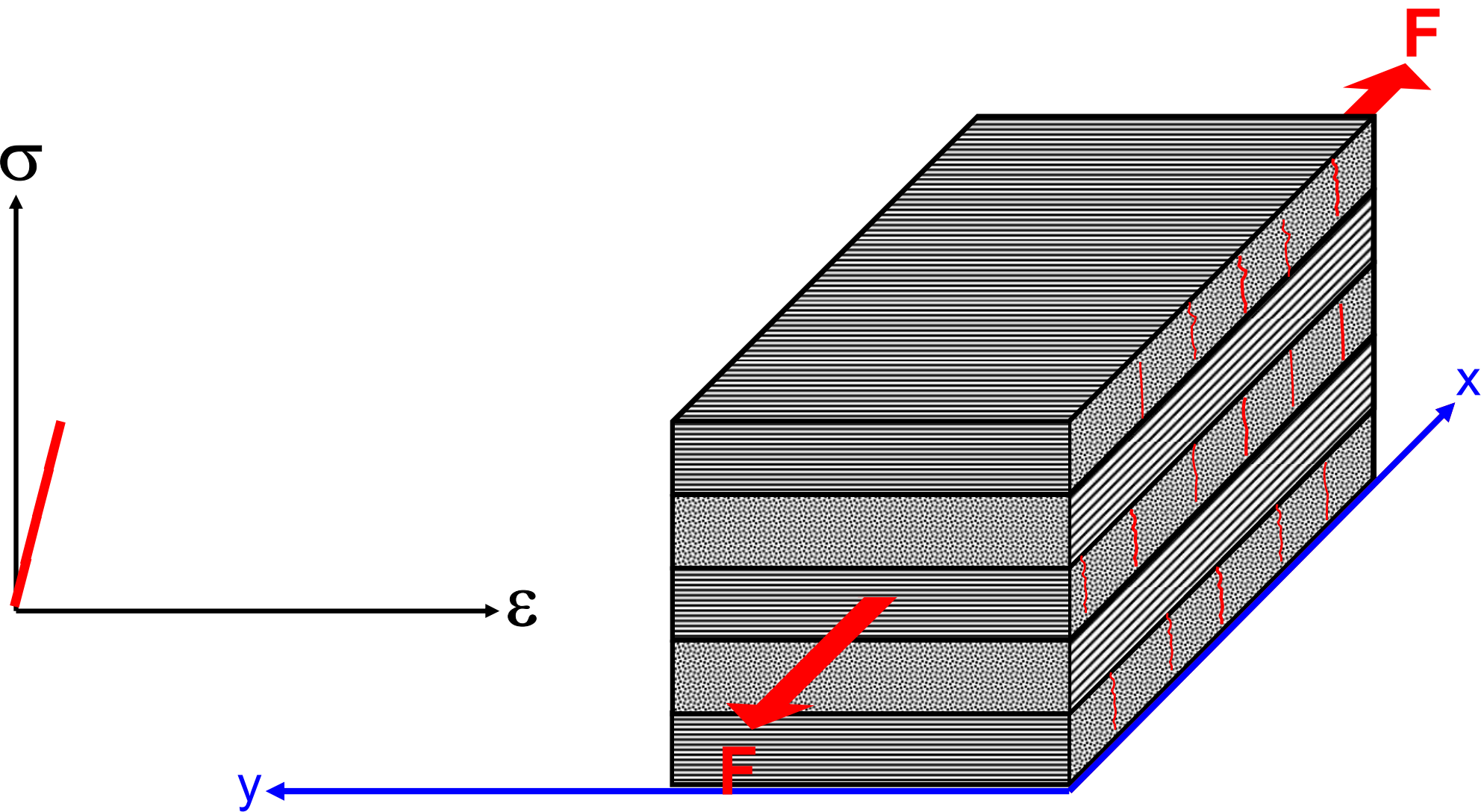
Nonlinear Failure Analysis



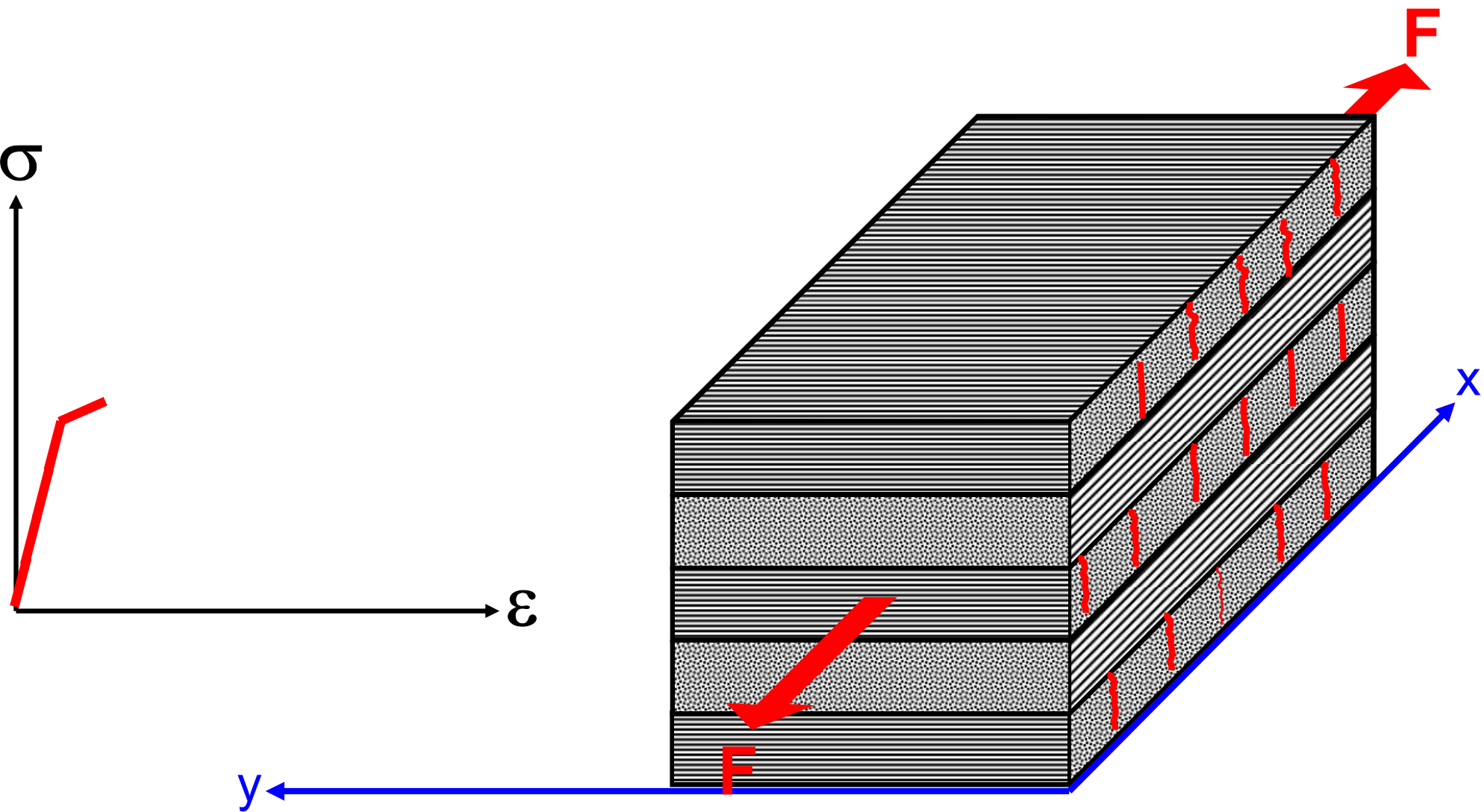
Nonlinear Failure Analysis



Nonlinear Failure Analysis

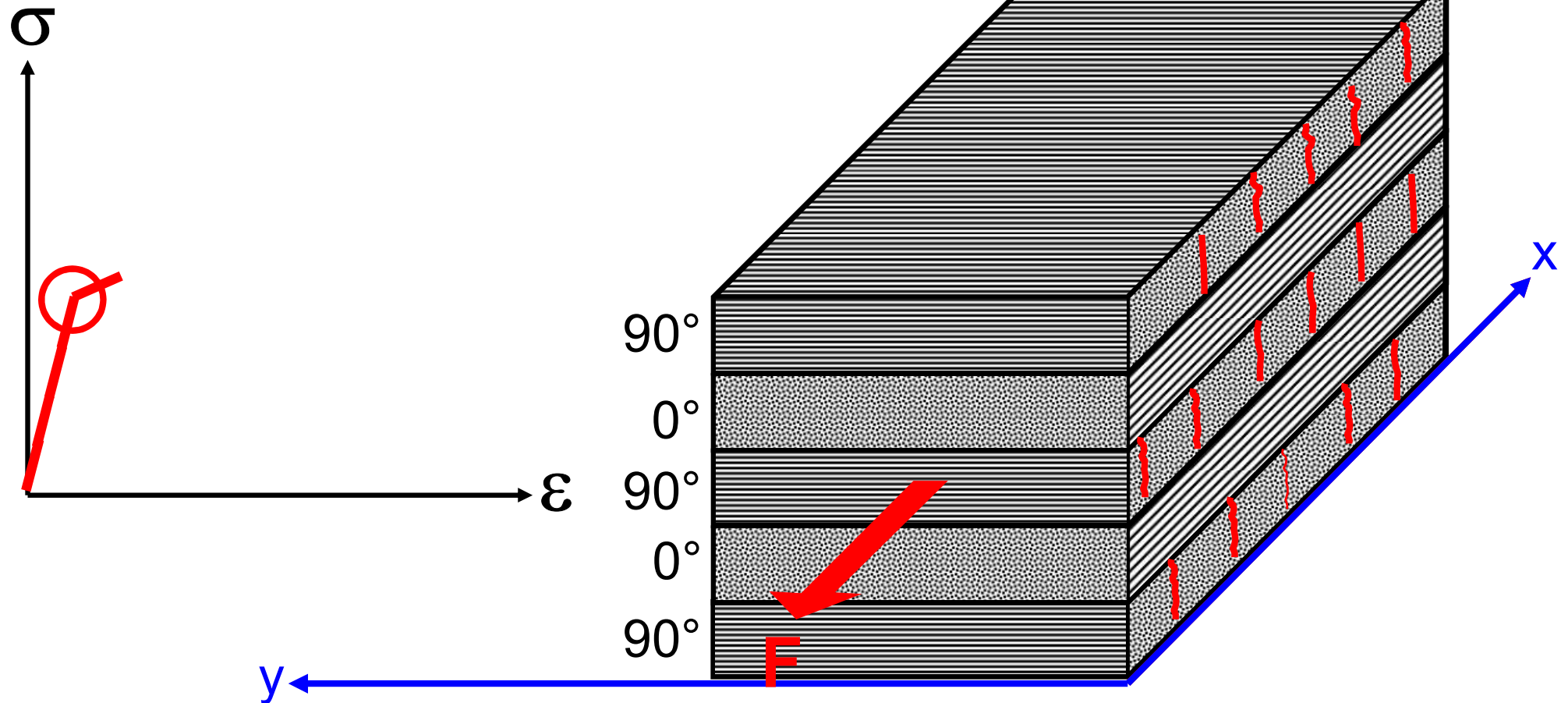


Nonlinear Failure Analysis



Quiz

After reaching the „kinking point“ \bigcirc
the elasticity constants of the
UD-Laminas have to be adjusted !



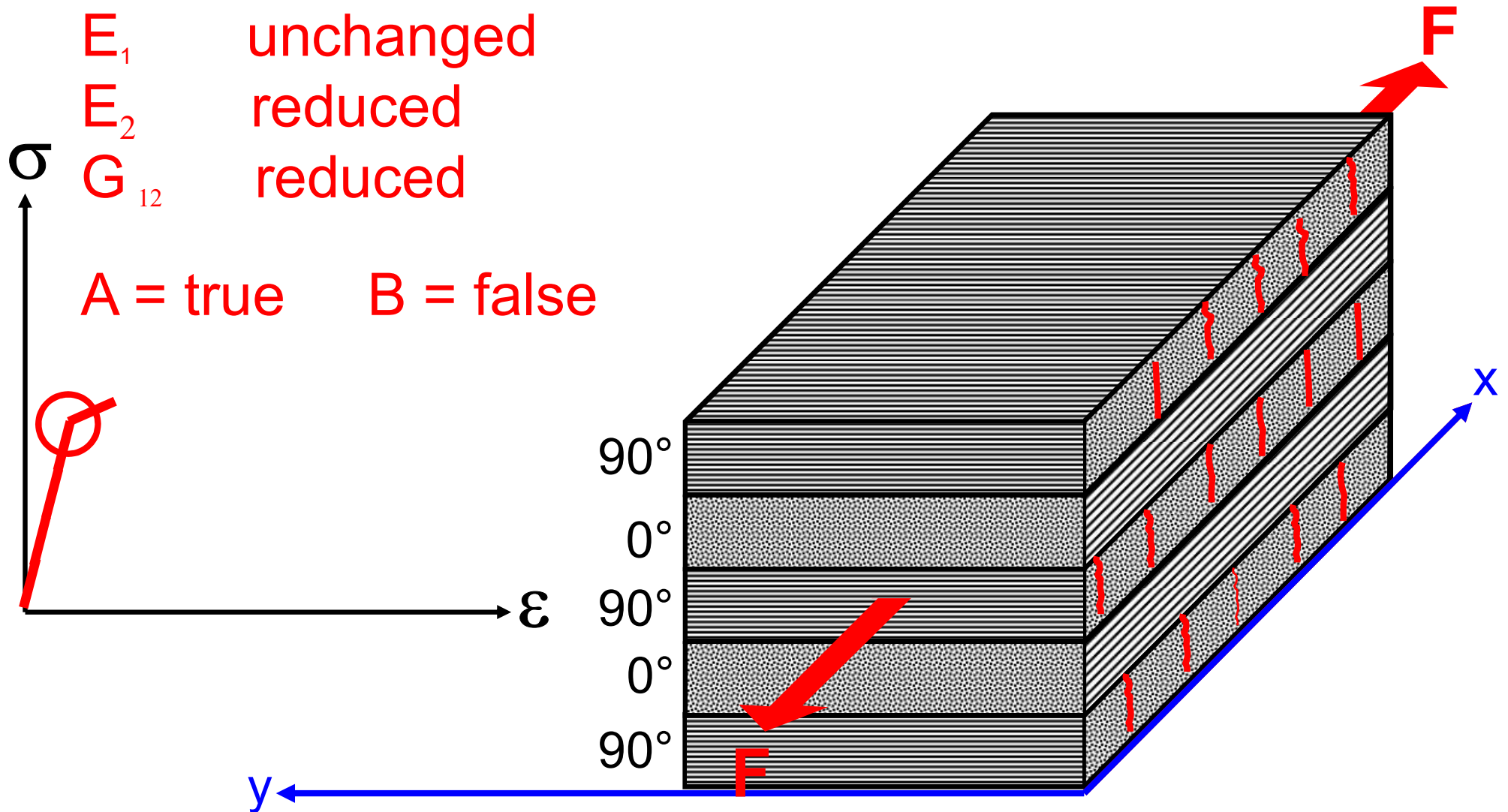
Quiz Which Measures shall be taken for 0° -Laminas?

E_1 unchanged

E_2 reduced

G_{12} reduced

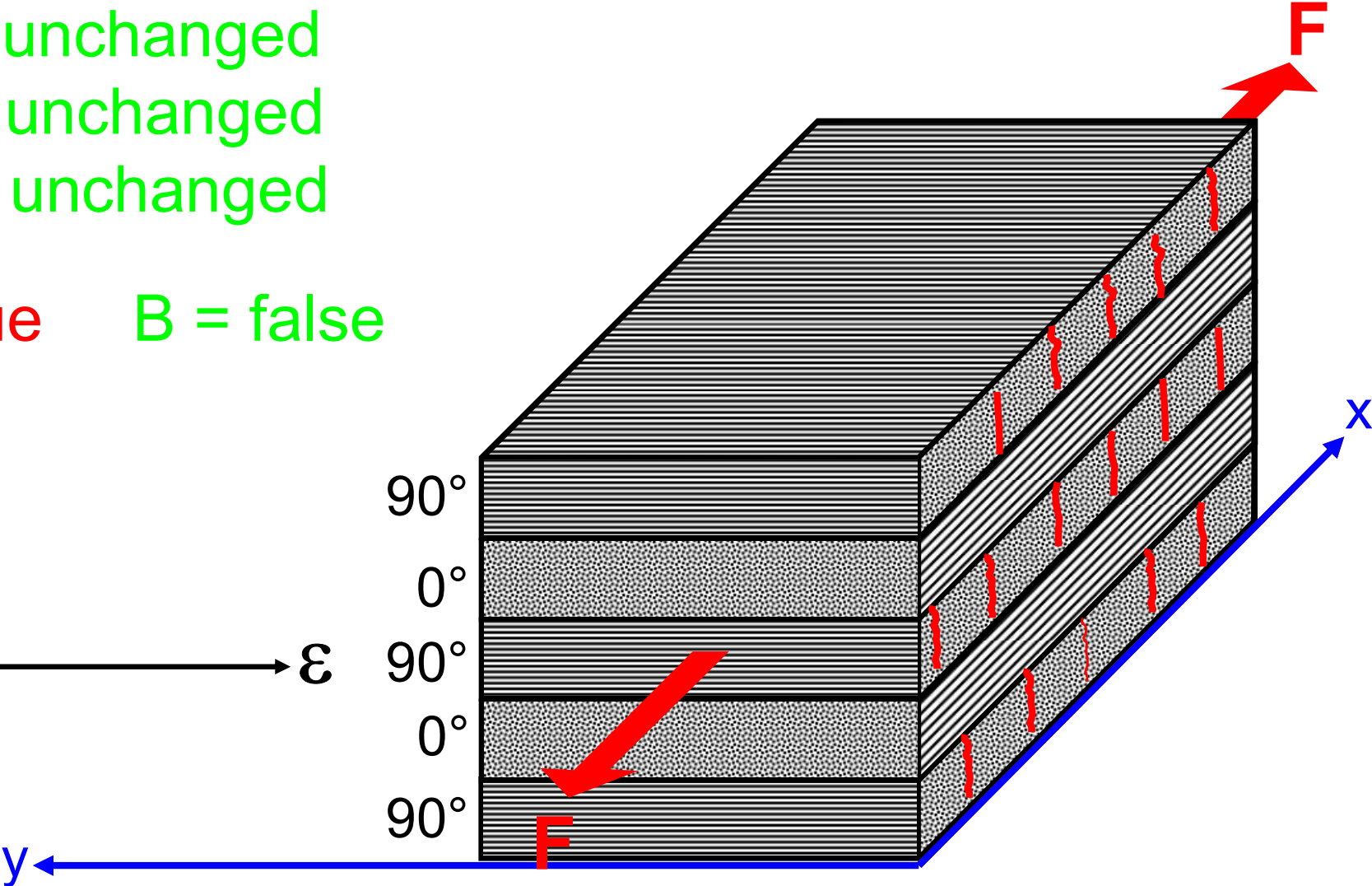
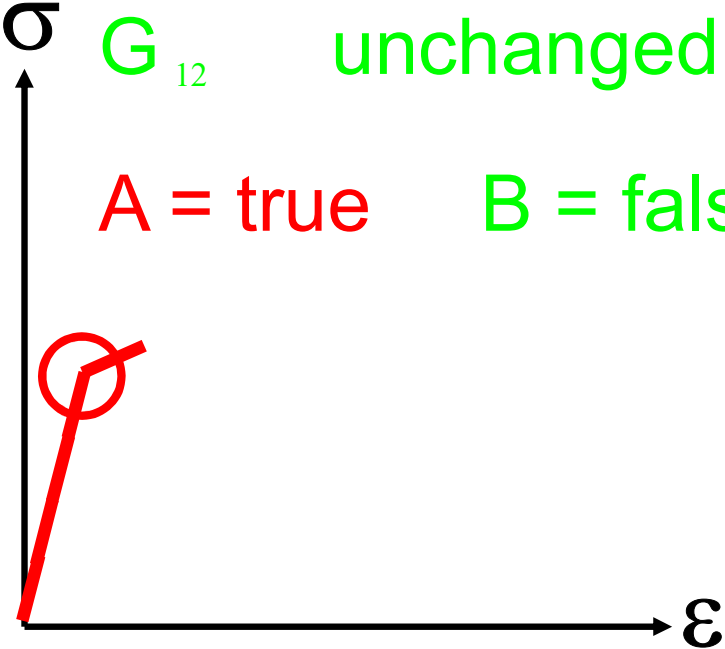
A = true B = false



Answer to Quiz

E_1 unchanged
 E_2 unchanged
 G_{12} unchanged

A = true B = false



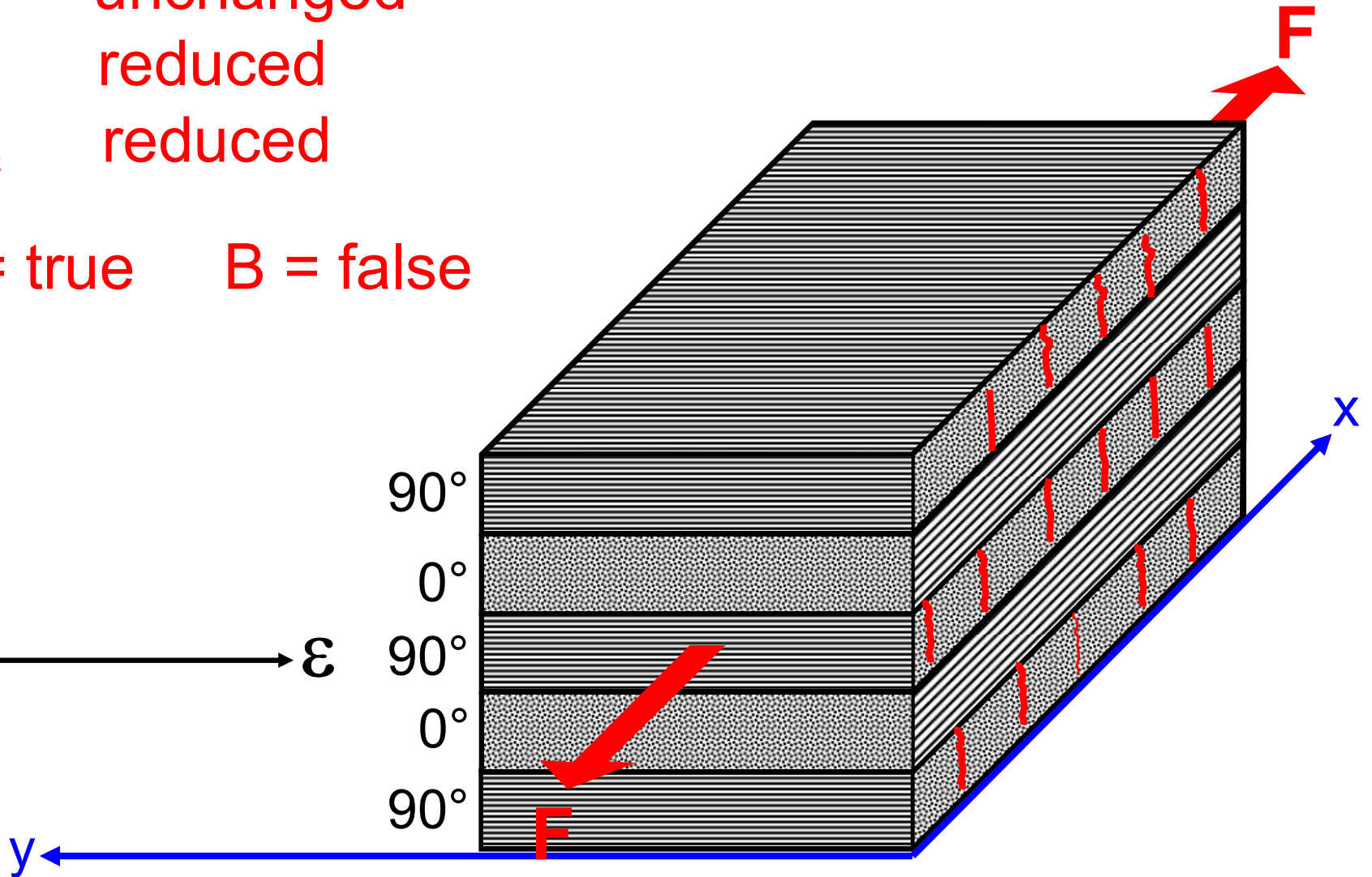
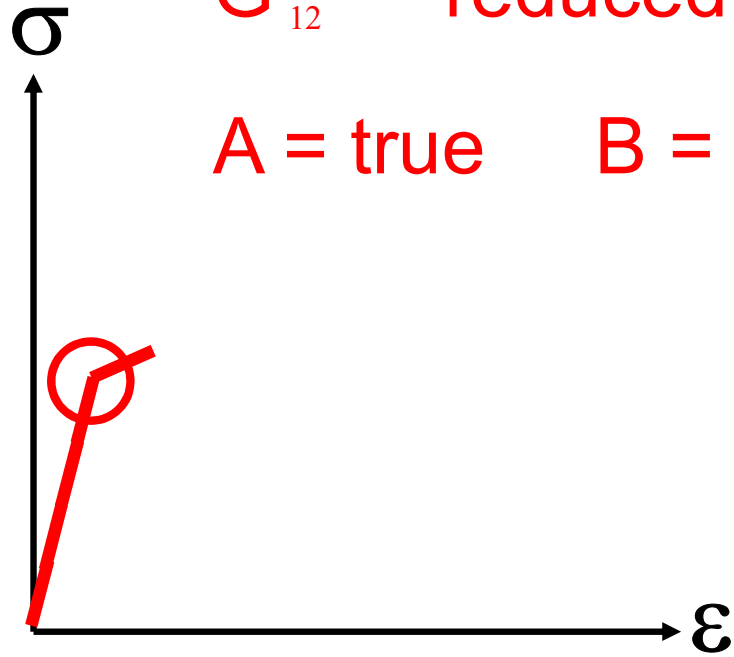
Quiz Which Measures shall be taken for 90°-Laminas?

E_1 unchanged

E_2 reduced

G_{12} reduced

A = true B = false



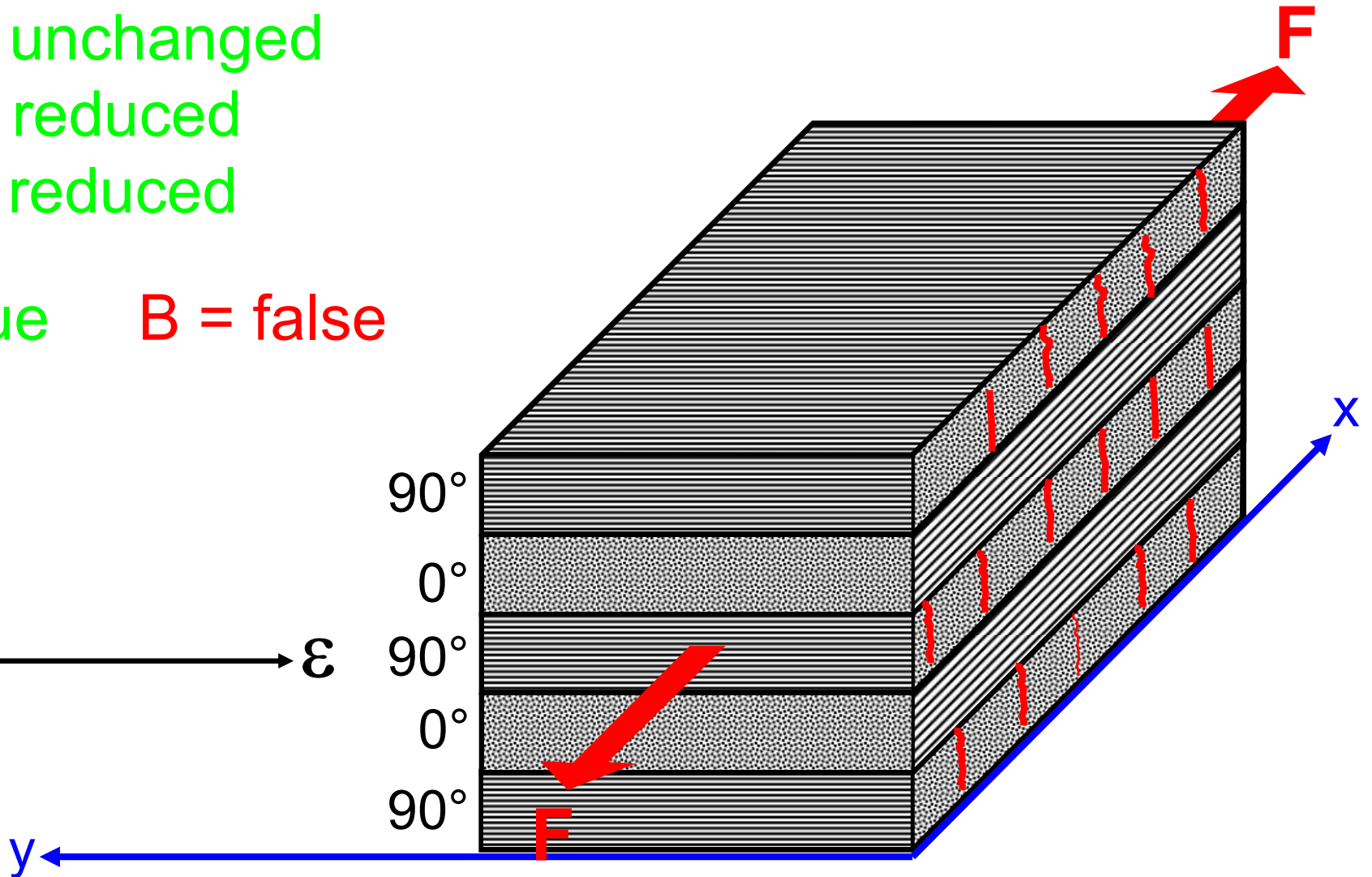
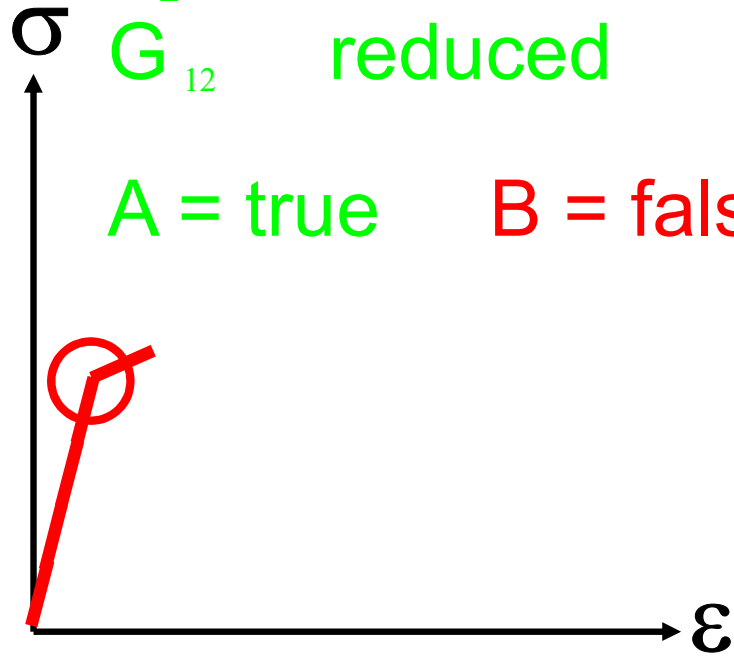
Answer to Quiz

E_1 unchanged

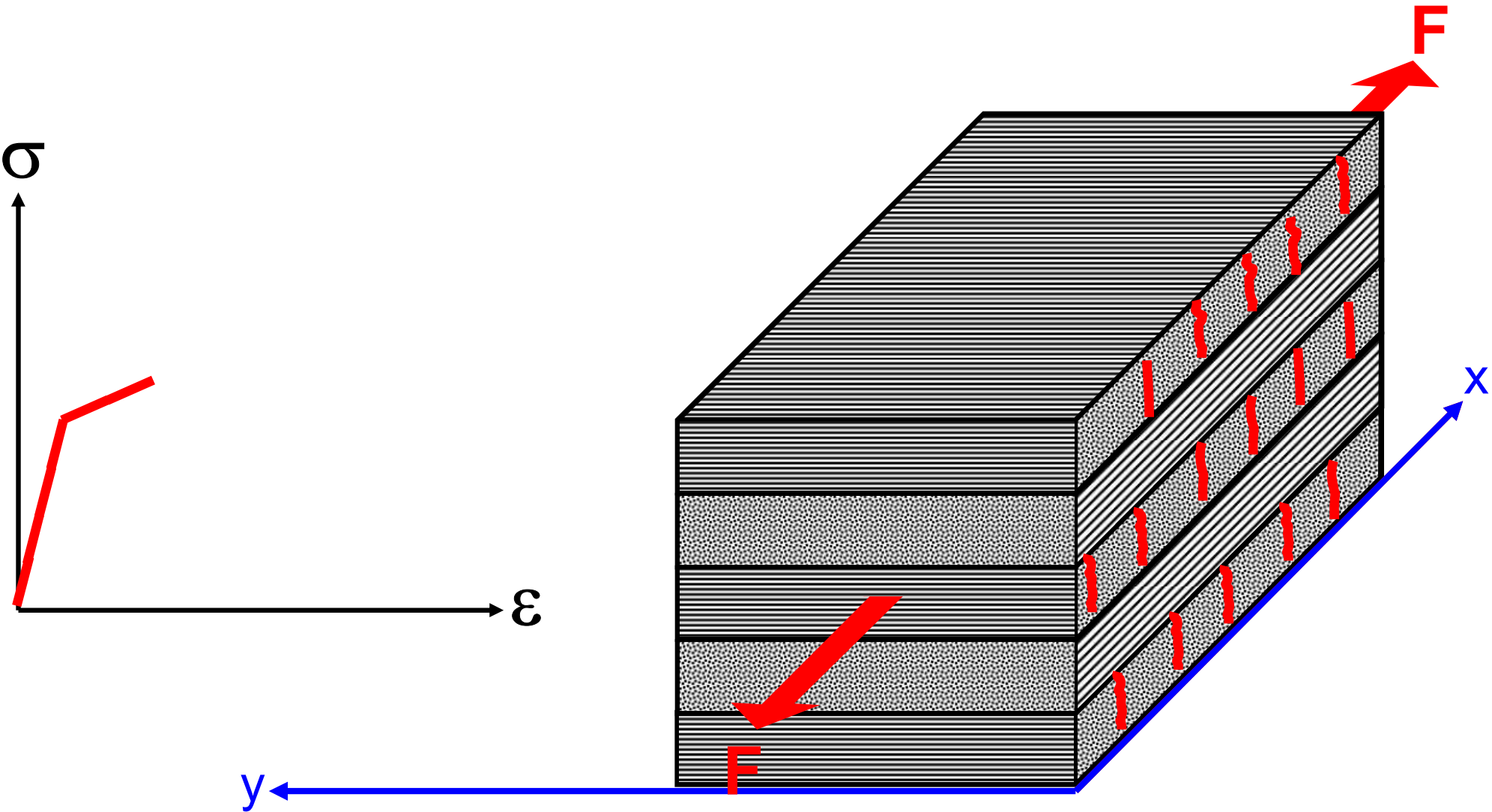
E_2 reduced

G_{12} reduced

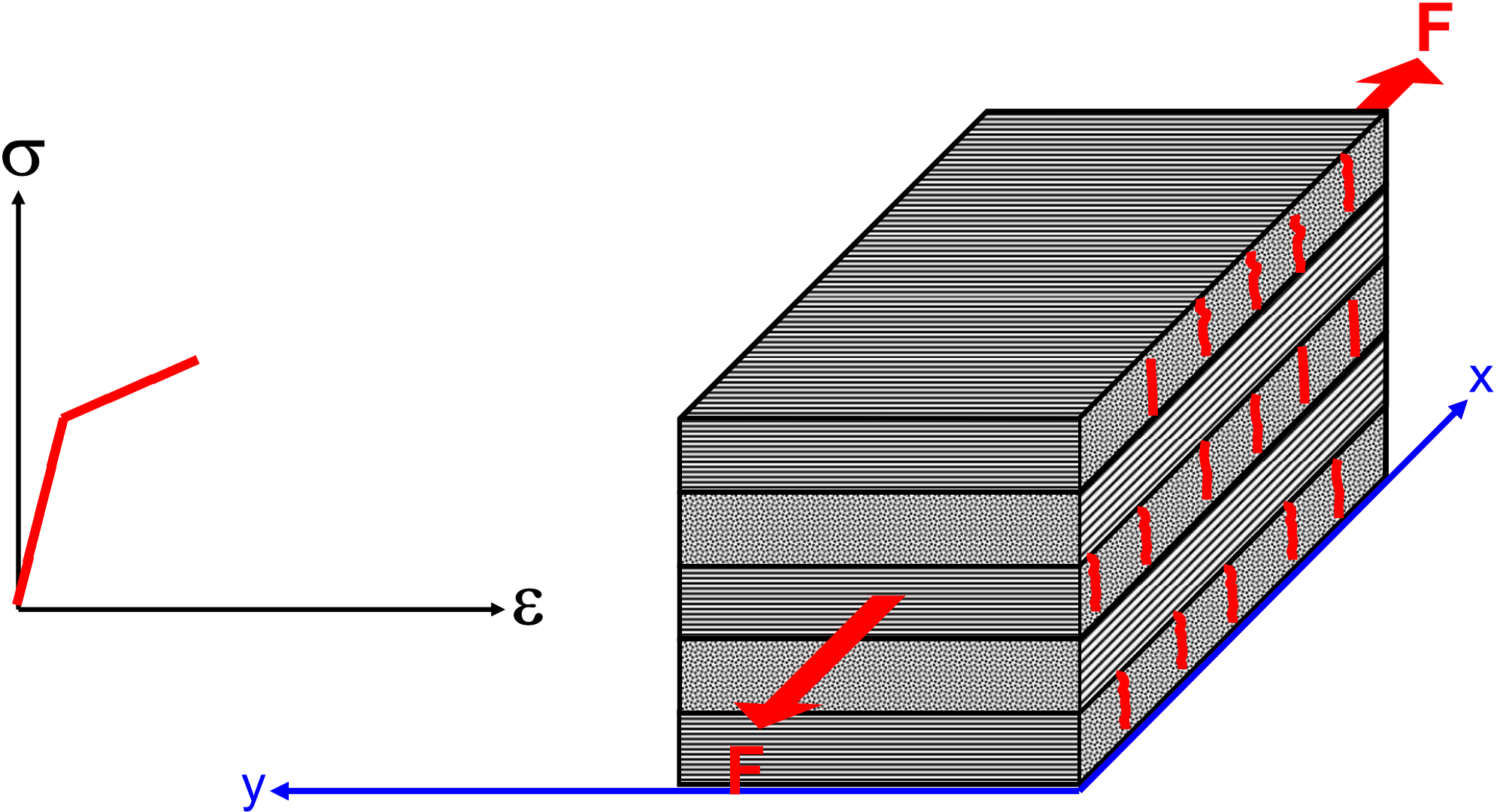
A = true B = false



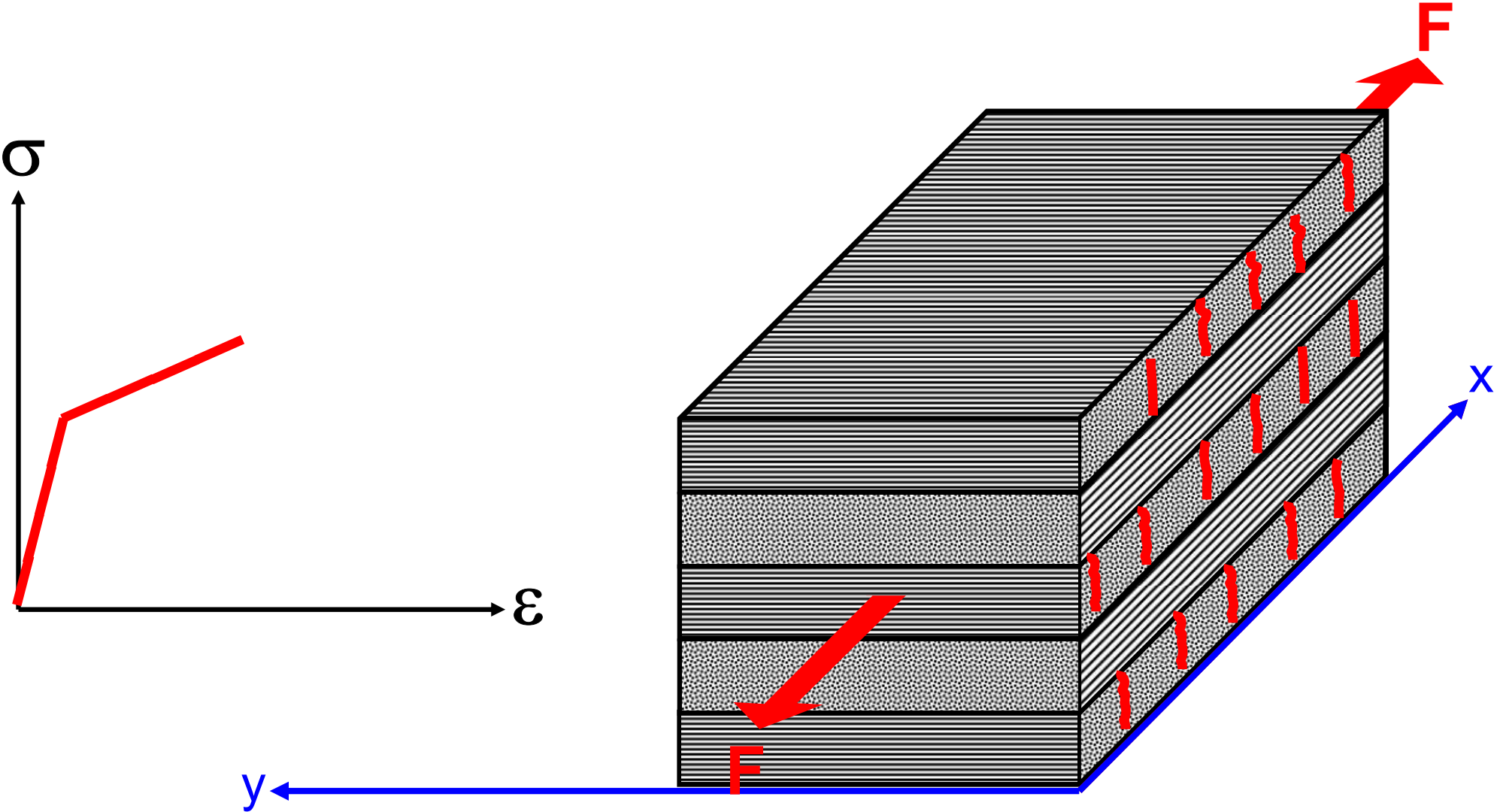
Ply by ply failure analysis



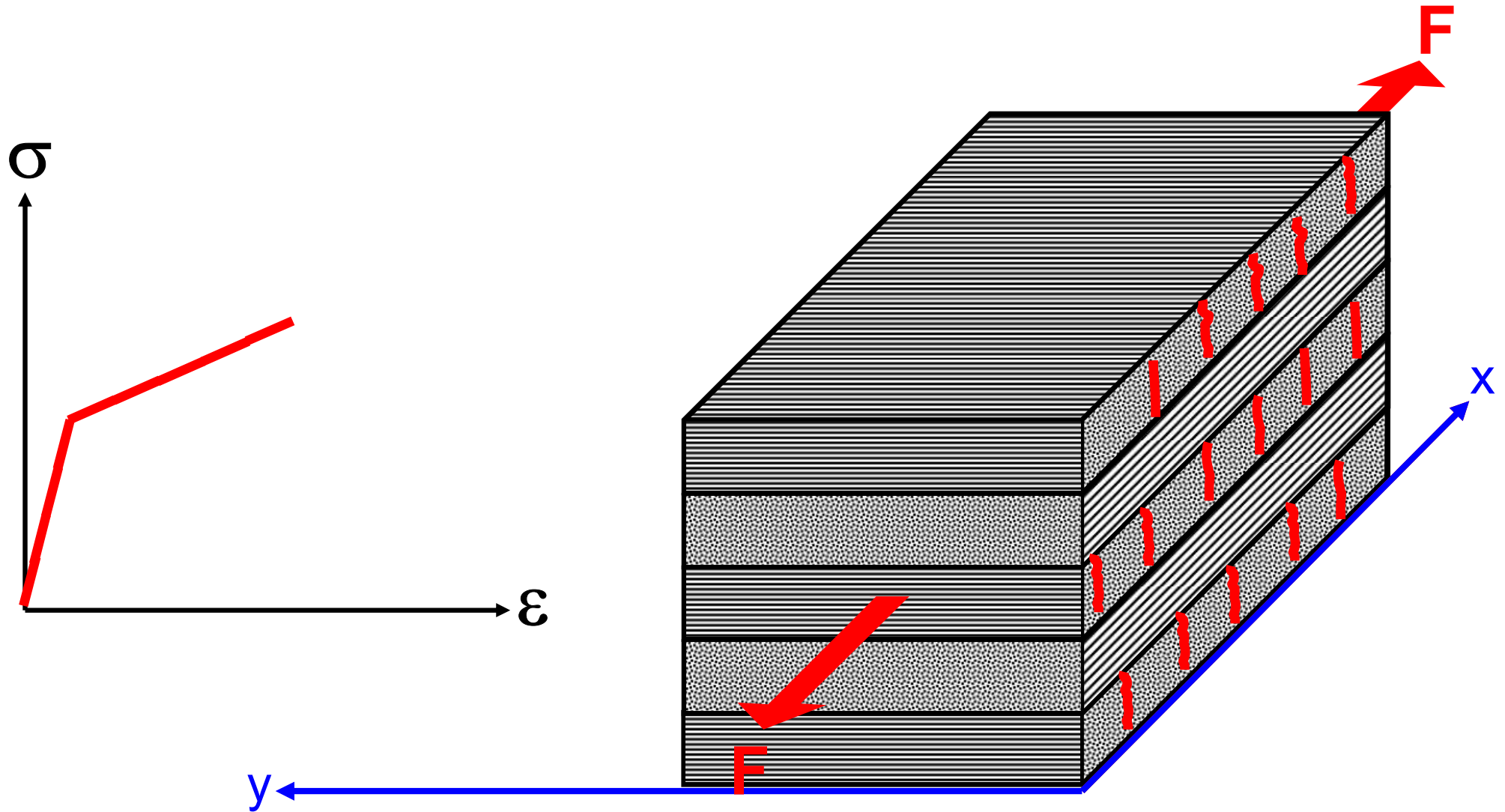
Ply by ply failure analysis



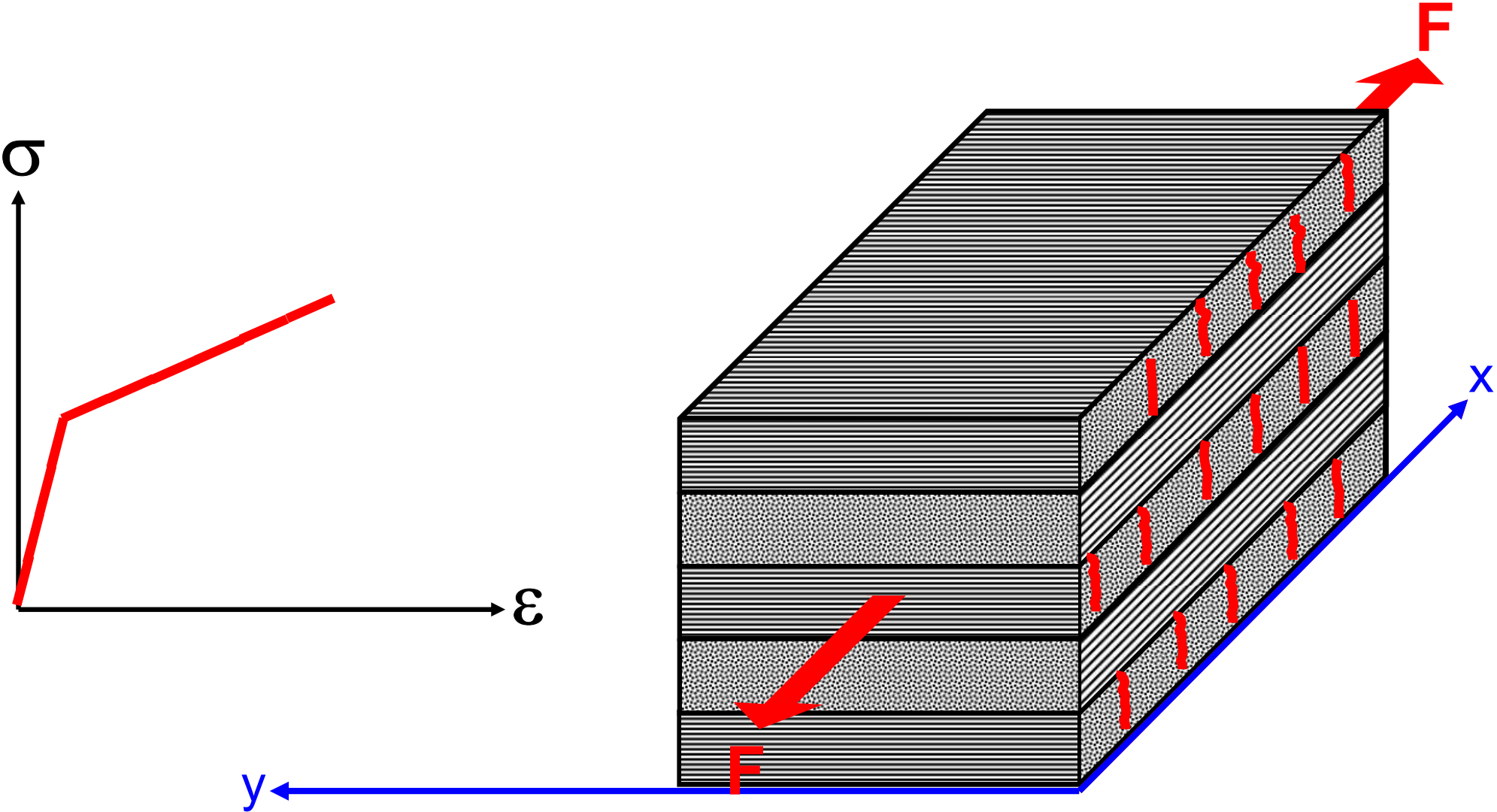
Ply by ply failure analysis



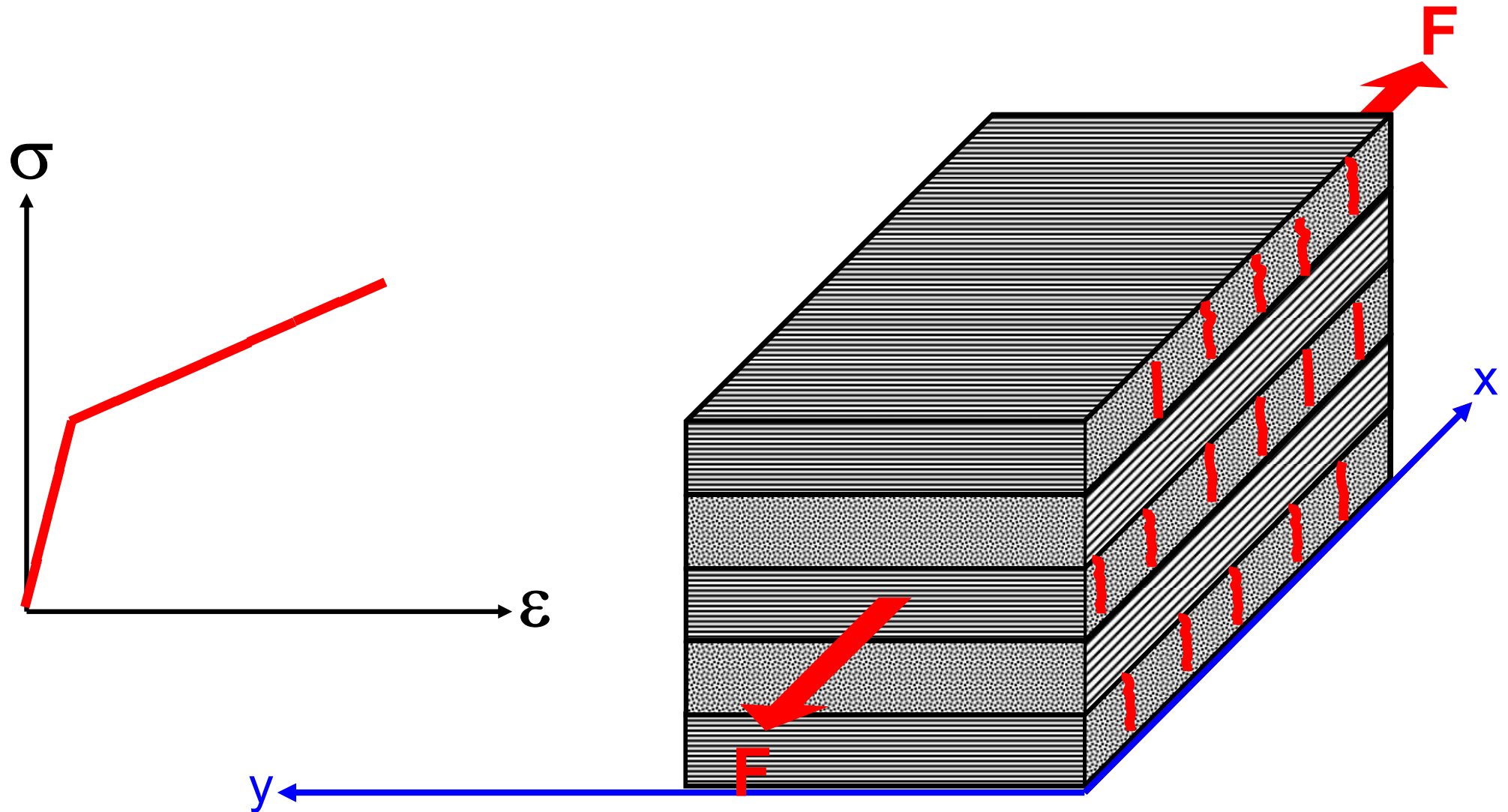
Ply by ply failure analysis



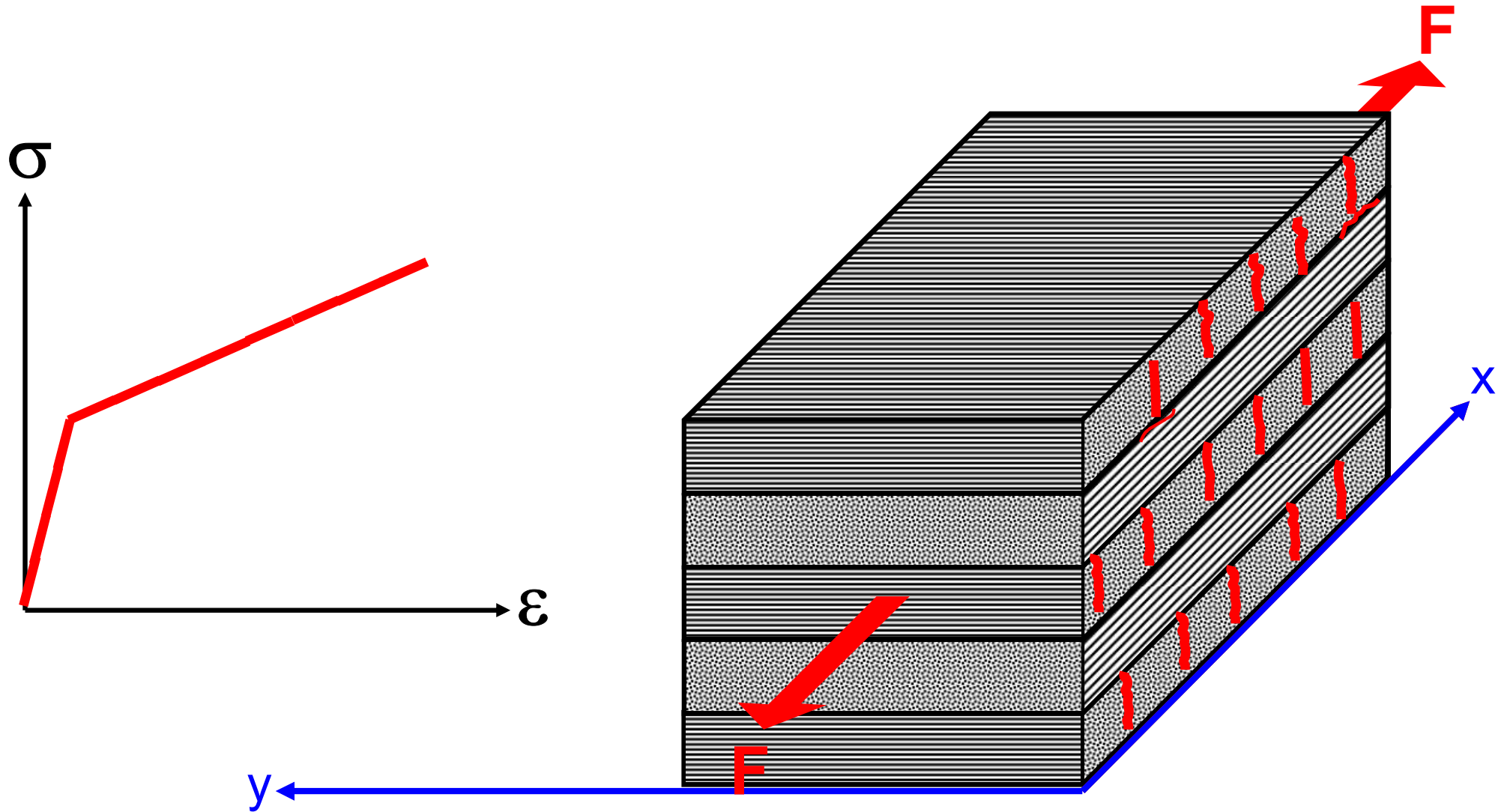
Ply by ply failure analysis



Ply by ply failure analysis



Ply by ply failure analysis



Ply by ply failure analysis

