

**04/05/2021**

## **HW18: Crack Tip Damage: CTOD as the Criterion for Fracture**

**Group I: You are given four physical quantities that describe fracture from damage at crack tips**

- the tensile yield stress
- critical value of CTOD
- plastic zone size

You also intuitively realize that in view of the plastic deformation in the damage zone the

- tensile yield stress must be important.

**Group II: The material parameters that describe crack propagation are**

- The work of fracture
- And the critical stress intensity factor or the fracture toughness

Use dimensional analysis (balancing the units) and physical intuition to relate the parameters in Group II to the parameters in Group I.