bmcs course

brittle/matrix cementitious composite structures

oricrete*: Yoshimura vault, RWTH Aachen (2015)*

Jena, Germany, Dyckerhoff-Widmann (1922-1923)

Rostislav Chudoba
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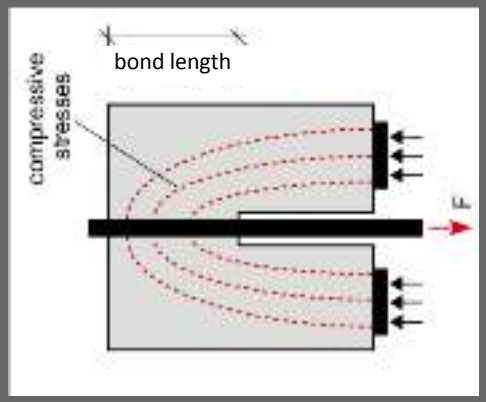
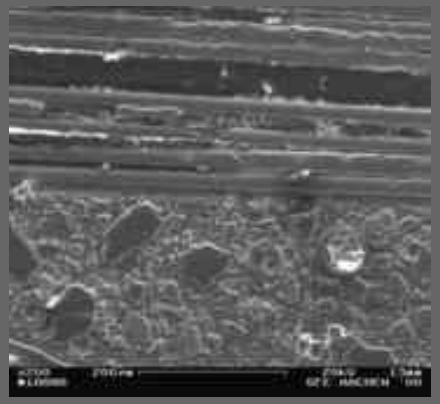
IMB RWTH AACHEN UNIVERSITY

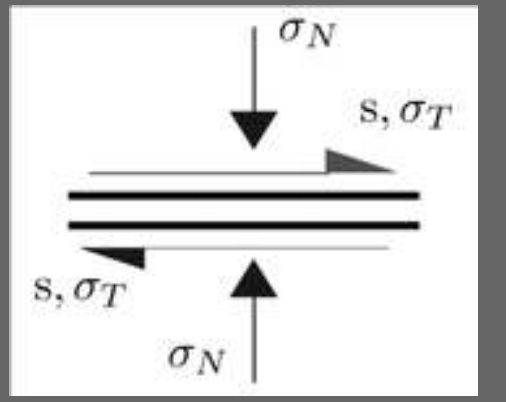
… what is this course about …

Bond - the ideal lab for learning the material modeling

→ how to measure and characterize the bond behavior?
→ what happens in the interface during debonding?
→ how to model the debonding process?
→ what happens if we change geometry or cross section?

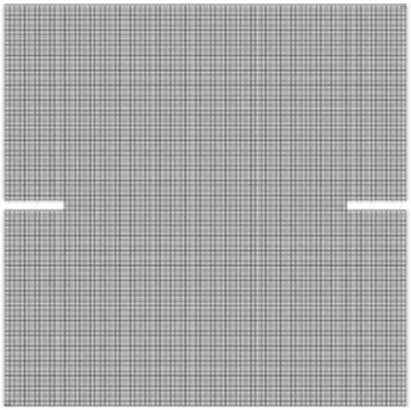


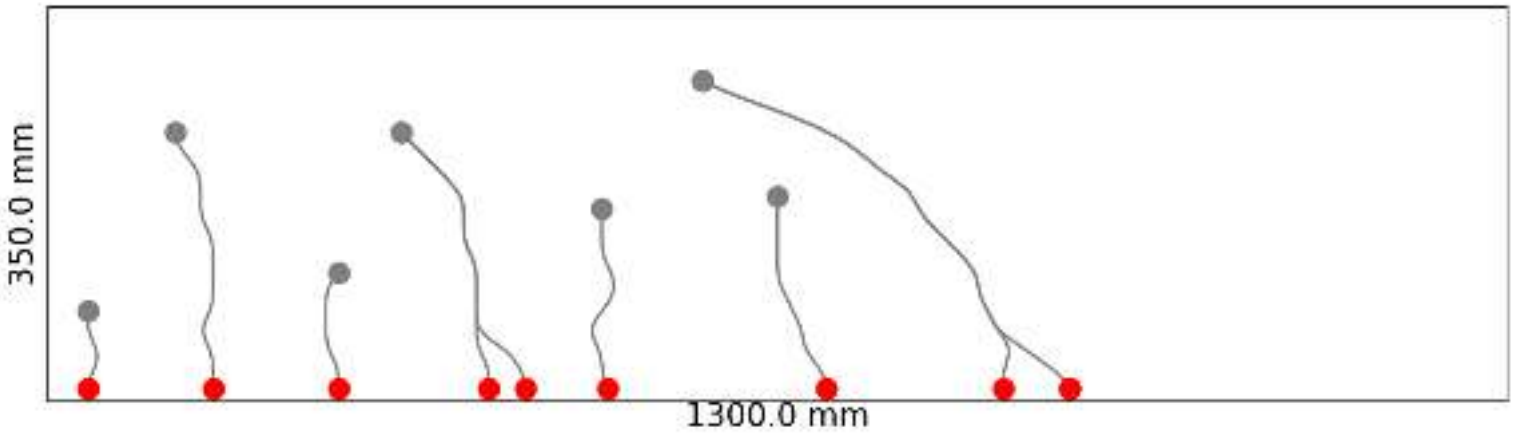


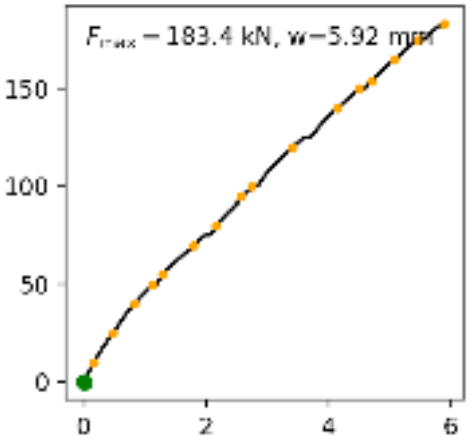


Cracking → brittle material behavior

→ can cracks be useful?
→ how do they emerge and propagate?
→ how to model them?
→ how to detect and observe them?

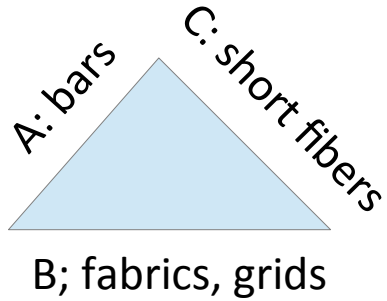


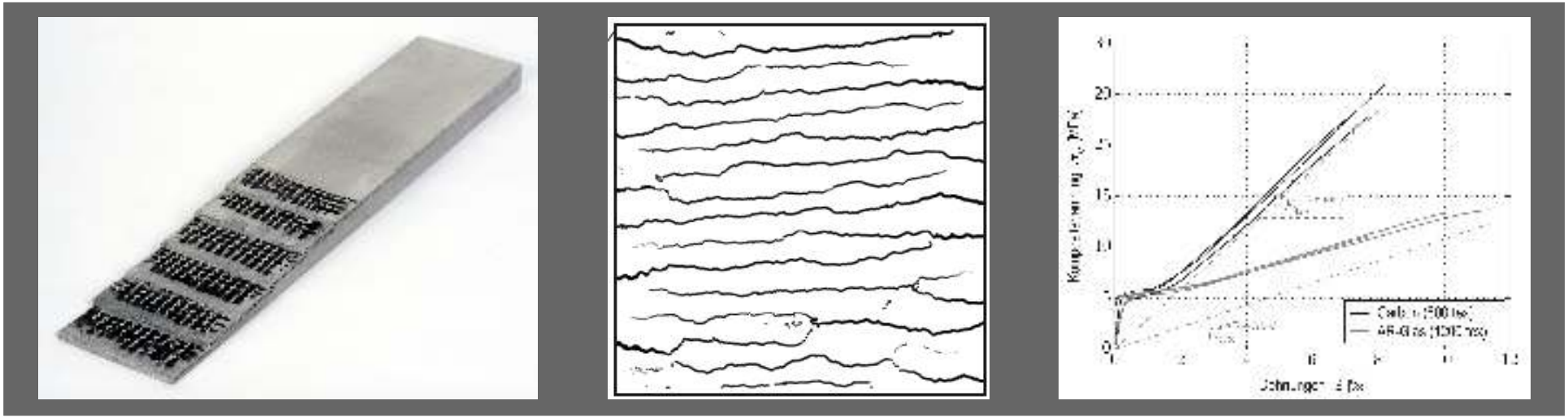




Composite – combine the advantages of two or more materials

→ interplay of cracking / debonding ?
→ how does it affect the material behavior?
→ how to test / model / characterize it?
→ how to design a high performance material?



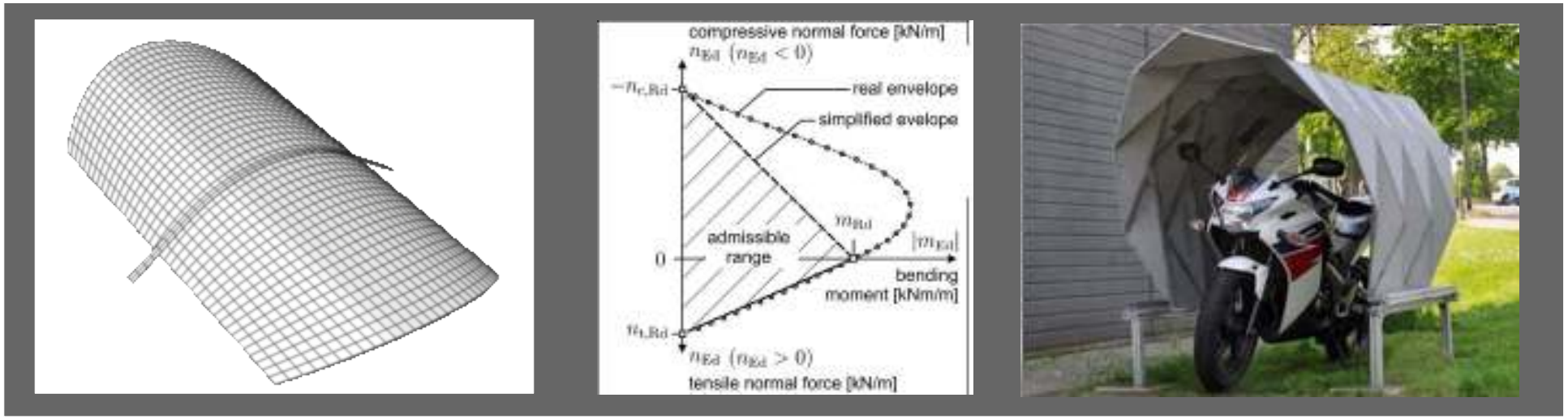


Brittle-matrix composite structures

→ structural behavior ?

→ design & assessment methods ?

→ applications & development potential ?



FROM ANALYSIS TO DESIGN

Change in paradigms of structural design

How to manage the complexity?

METHODS?

How to manage the complexity?

ELEMENTARY → COMPLEX

LOCAL → GLOBAL

GENERAL → SPECIAL

ABSTRACT → CONCRETE

IDELIZATION → MODEL → CALIBRATION → VALIDATION

MECHANISMS

GENERAL

EL elastic

DB debonding / friction

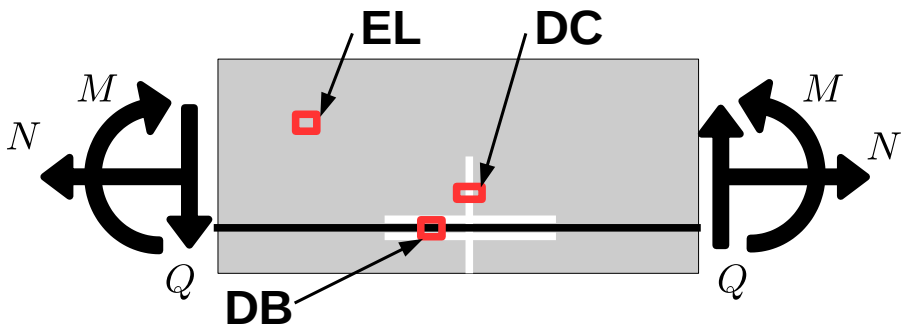
DC decohesion

ELEMENTARY CONFIGURATIONS

M M

STRUCTURES

MECHANISMS



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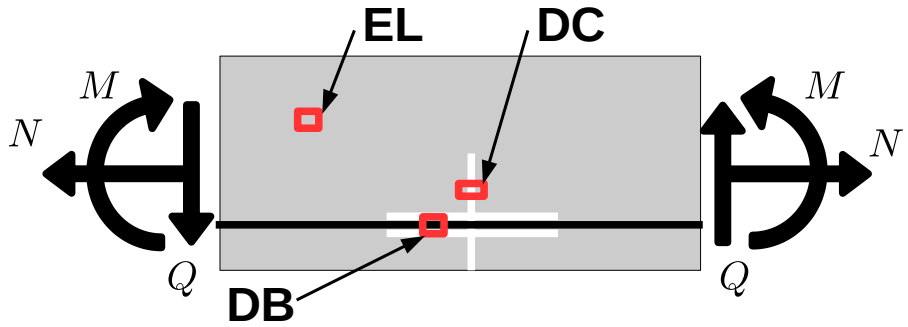

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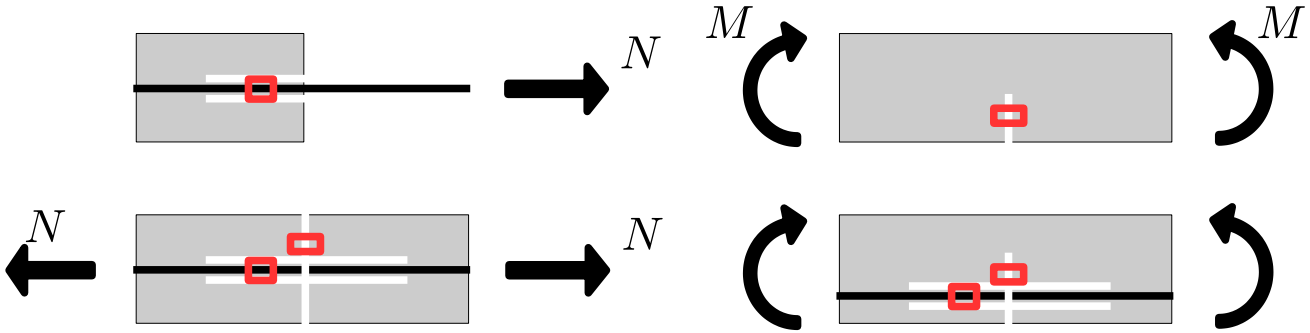

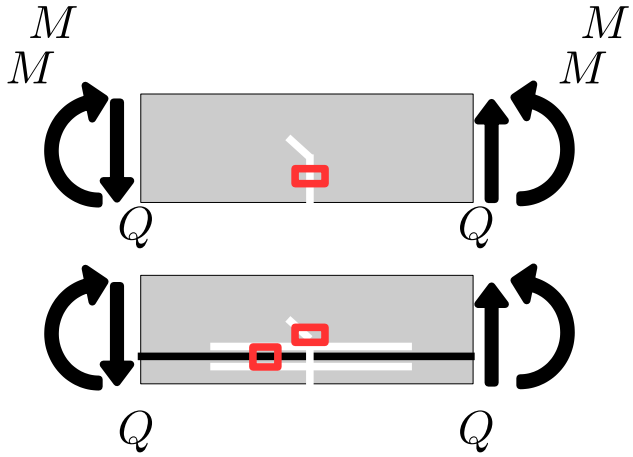

STRUCTURES

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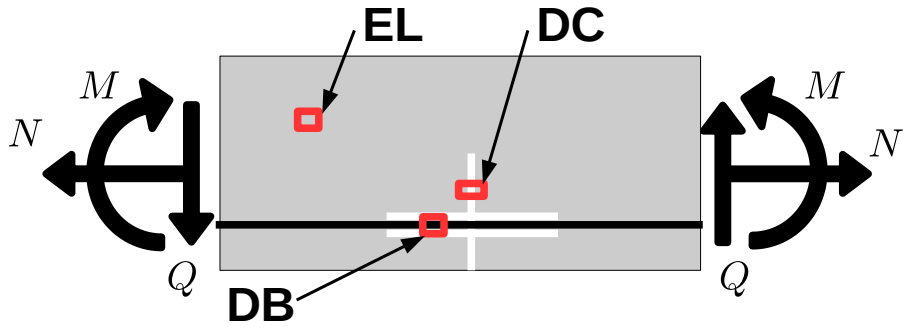

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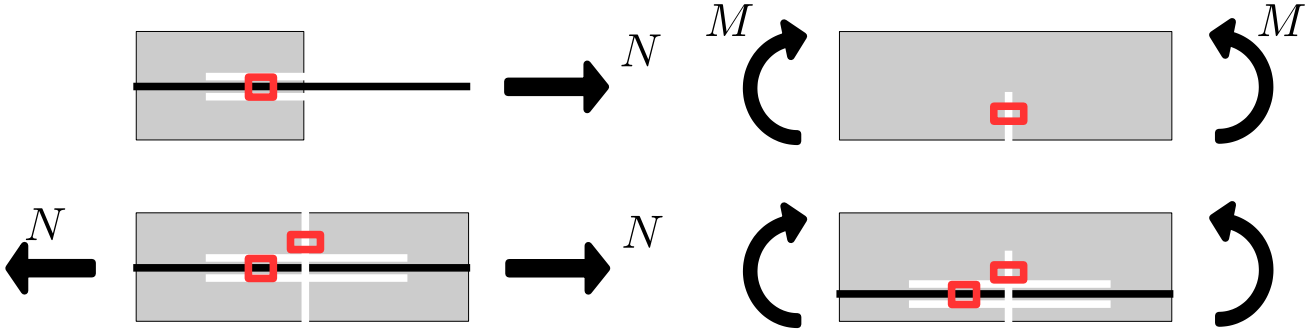

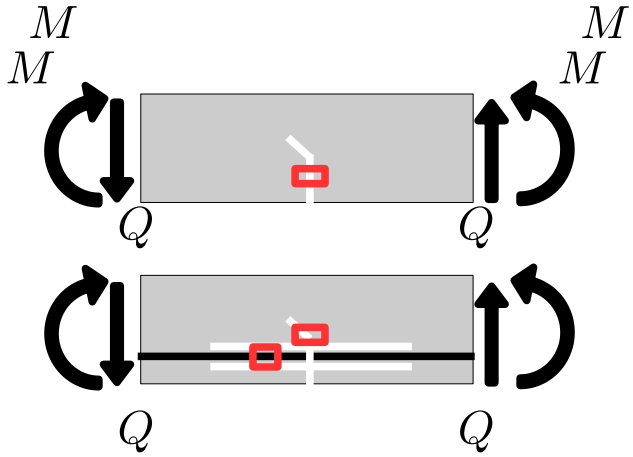

STRUCTURES