Computational & Multiscale Mechanics of Materials

CM3

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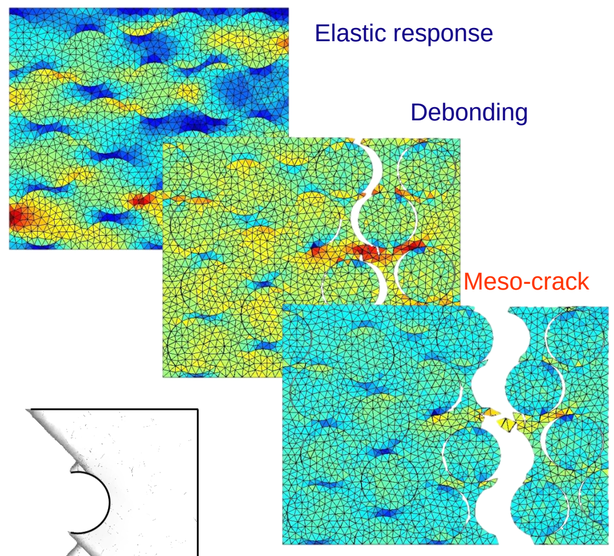
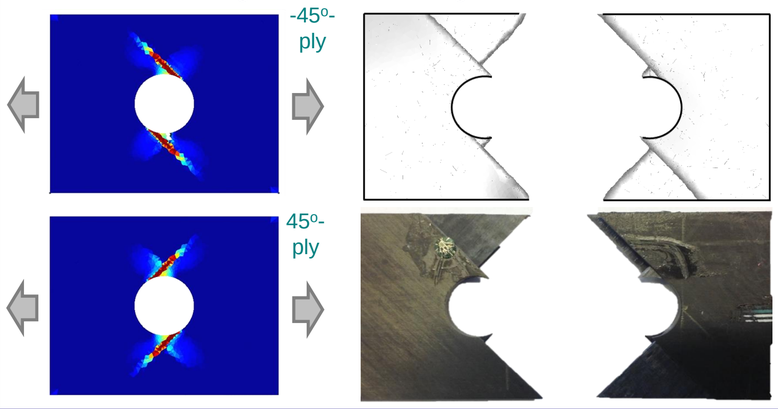
Multi-Scale Fracture of Composite Materials

Multi-scale framework
- MFH homogenization
- Micro-meso crack transfer
- Non-local approach

SIMUCOMP ERA-NET project
- e-Xstream, CENAERO, ULg
- IMDEA Materials (Spain)
- CRP Henri-Tudor (Luxemburg)



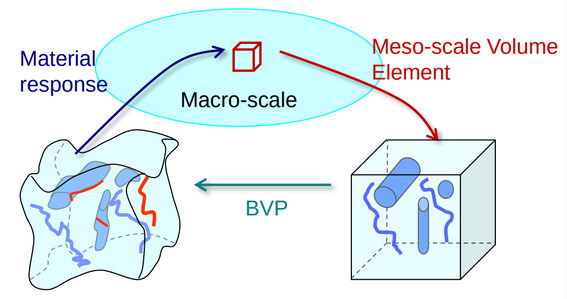
Non-local damage mean-field-homogenization



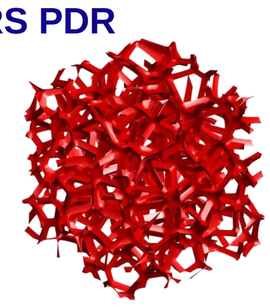
DG-based micro-scale fracture framework

Computational Multi-Scale Models for Foamed Materials

Computational multi-scale
- Instabilities scales transition
- Variability effects

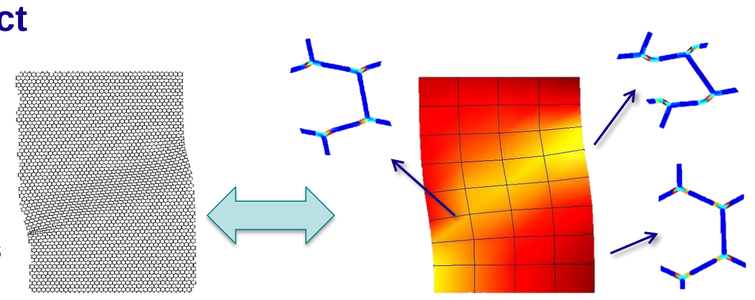


EnLightenIt FNRS PDR
- Open foam
- A&M, ULB, UL



Level-set constructed RVE

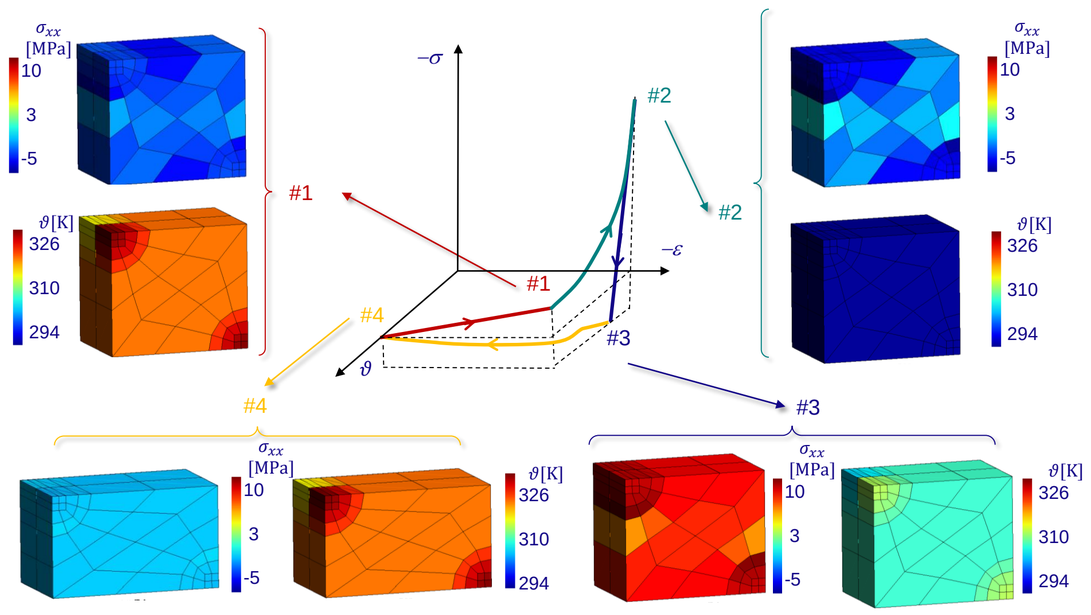
BRIDGING ARC project
- Honeycomb buckling
- A&M, EEI, ICD, CERM



FE2 homogenization of cellular structures with micro-buckling

Microscale model of smart composites

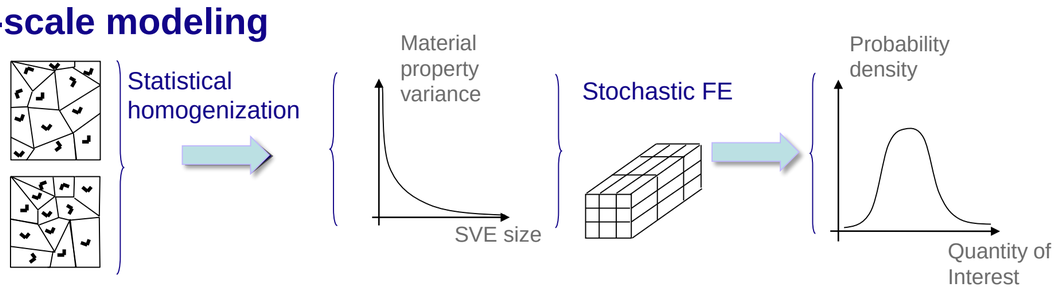
Shape memory composites
- Carbon fiber reinforced shape memory polymer
- Triggered by Joule effect



EU EPIC fellowship & S3CM3 ARC (A&M, EEI, CERM)

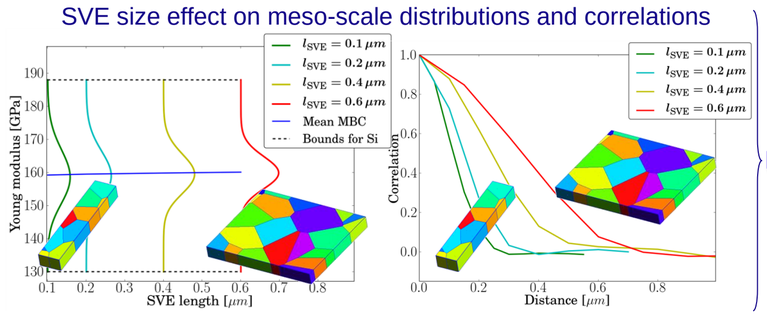
Stochastic 3-Scale Model of Poly-Crystalline Materials

3-scale modeling

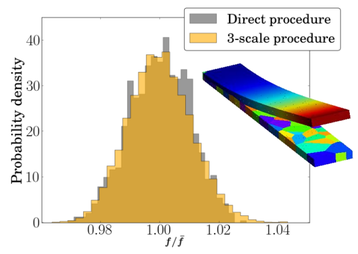


MEMS resonator

SVE size effect on meso-scale distributions and correlations



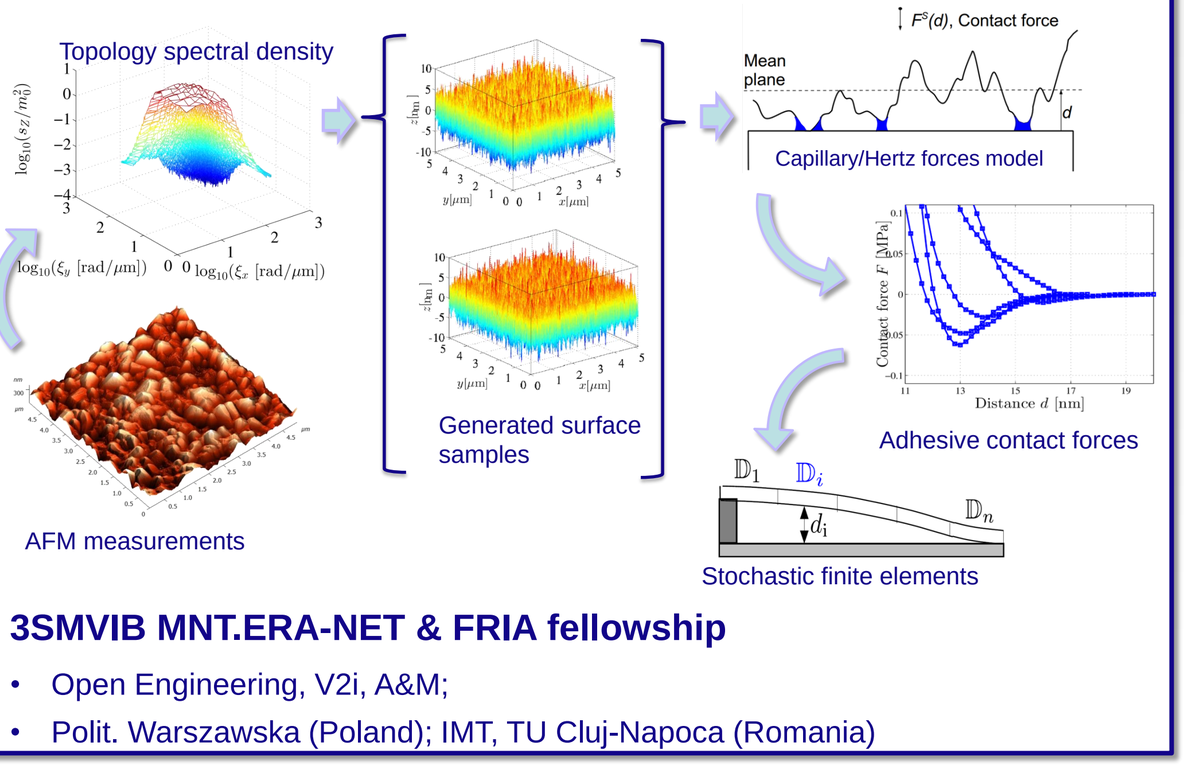
MEMS resonance frequency distribution



3SMVIB MNT.ERA-NET
- Open Engineering, V2i, A&M;
- Polit. Warszawska (Poland); IMT, TU Cluj-Napoca (Romania)

Stochastic Multi-Scale Model for MEMS Stiction

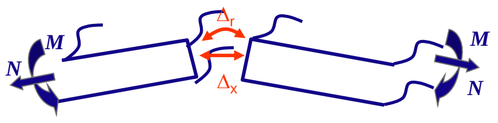
From the asperity level to the MEMS structure

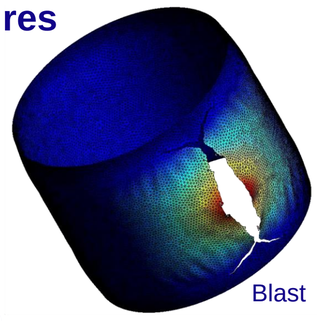


3SMVIB MNT.ERA-NET & FRIA fellowship
- Open Engineering, V2i, A&M;
- Polit. Warszawska (Poland); IMT, TU Cluj-Napoca (Romania)

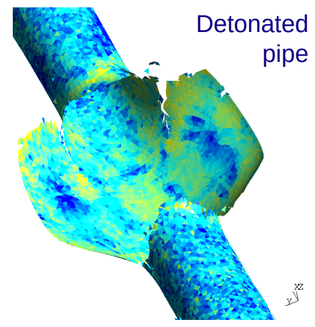
Discontinuous Galerkin/Cohesive Law Fracture Models

Blast loading of thin structures



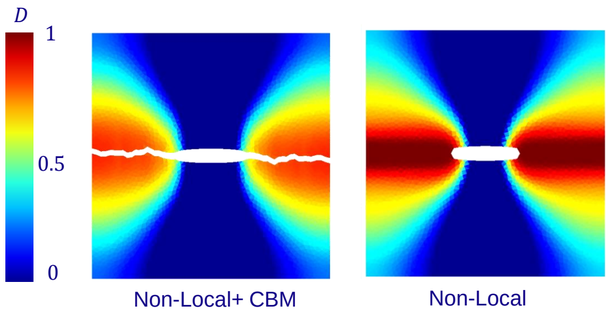


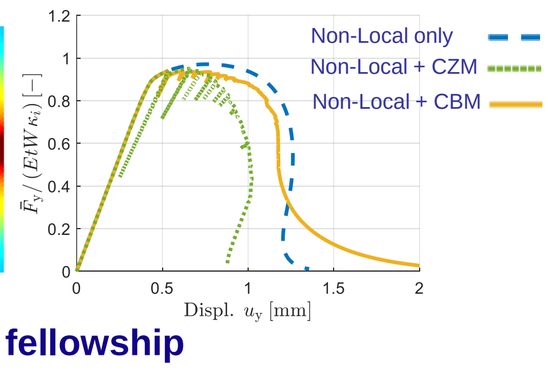
Blast loaded cylinder



Detonated pipe

Damage to Crack Transition





MRIPF (MecaTech project) & FRIA fellowship
- GDTech, UCL, FZ, MECAR, Capital People (Belgium)

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