Efficacy of FRP hooping in masonry domes
A simple numerical approach

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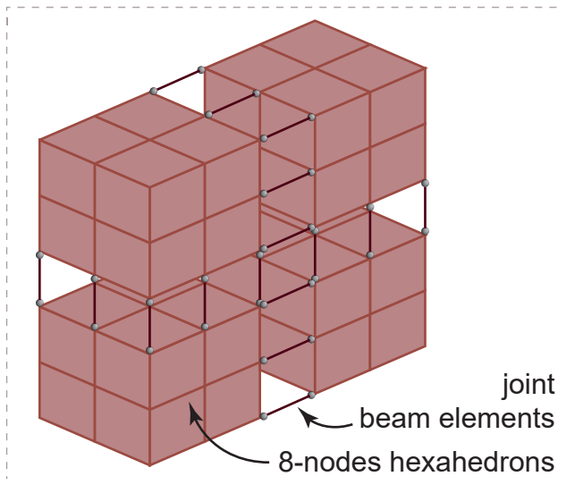
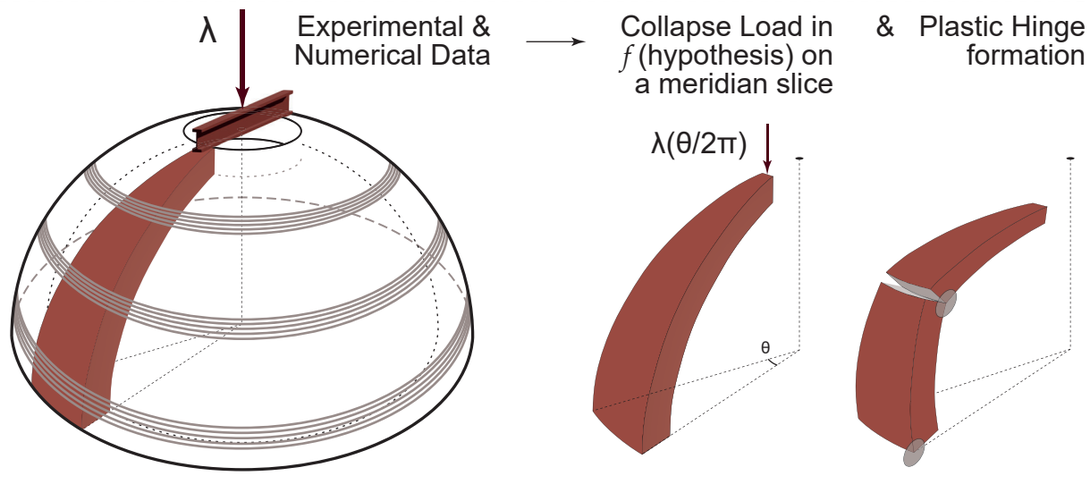
Masonry Domes

Statement of the issue
- Not only No-Tension Material
- No Dome = Arch simplifications
- Simple FRP by FEM approach

Clay Bricks: linear elastic
Mortar Joints: nonlinear





by Hypothesis:

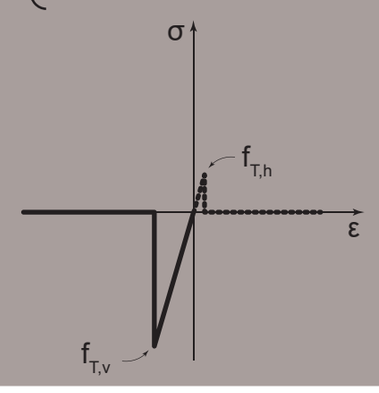
No Tension Material

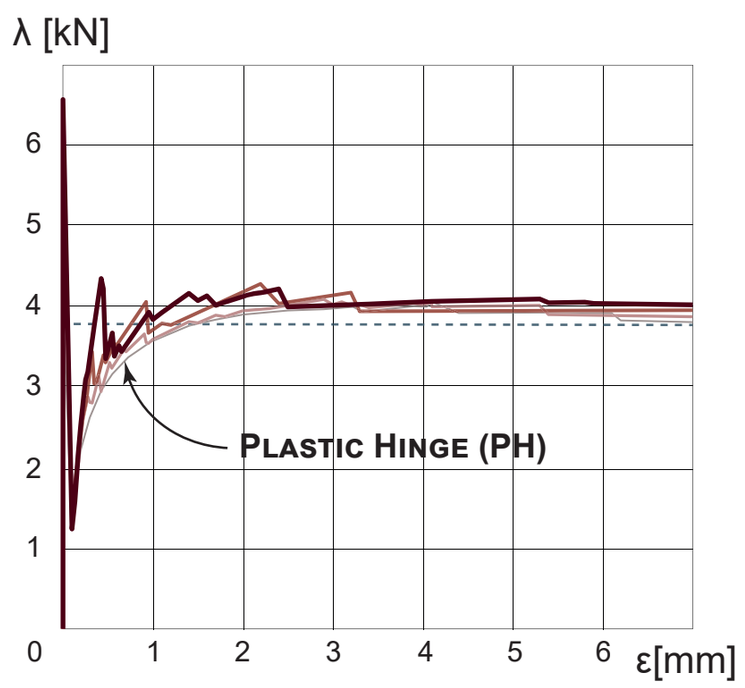
Y

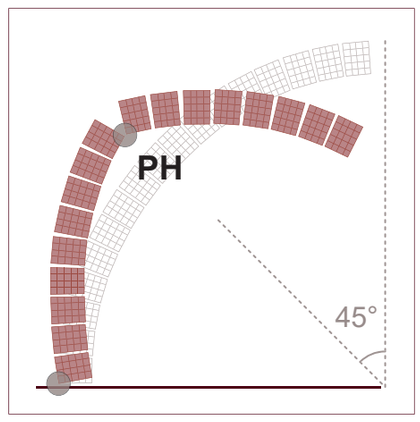
N

Point Contacts

$f_T \to 0$
$f_C \to \infty$
Sliding = 0
Small δ



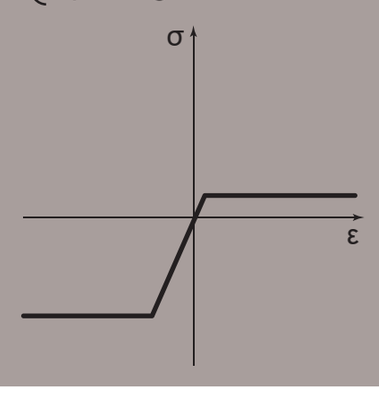


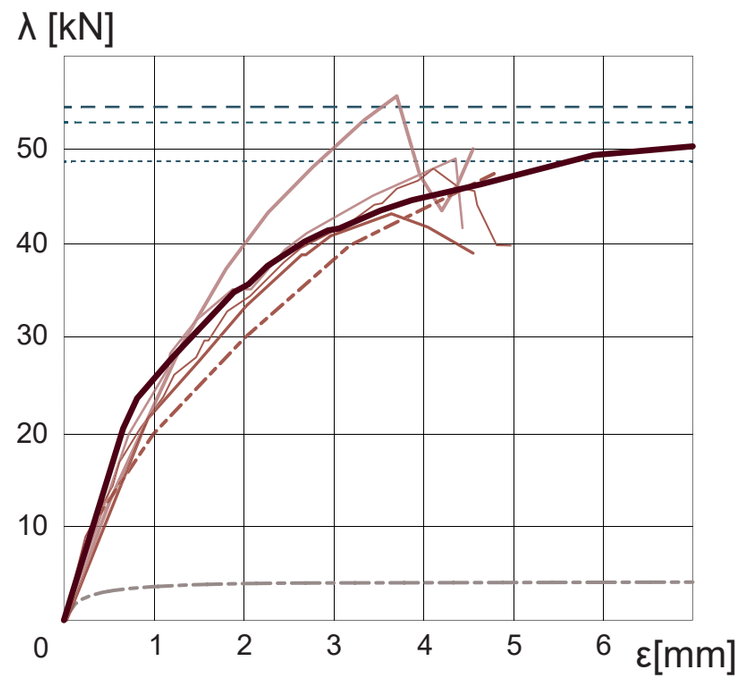


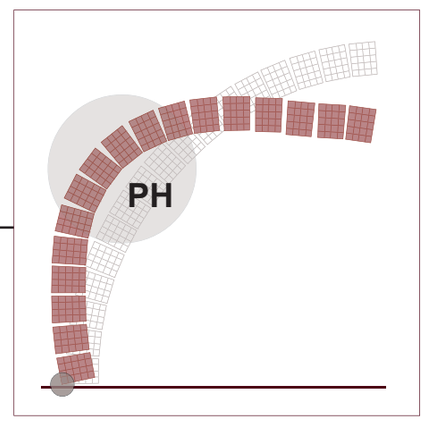
Tensile Strength & Orthotropy

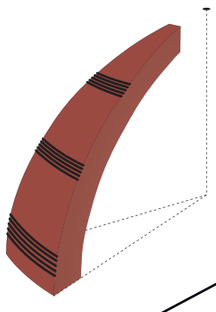
Cutoff Bars

$f_T \neq 0$
f_C limited
f_V limited !
$f_T \neq f_C$





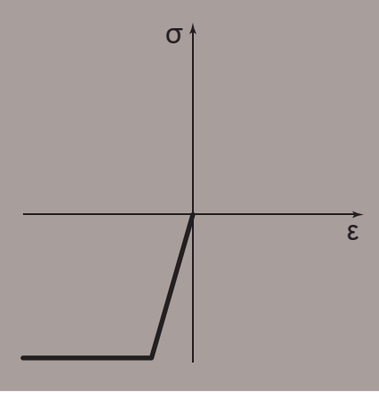


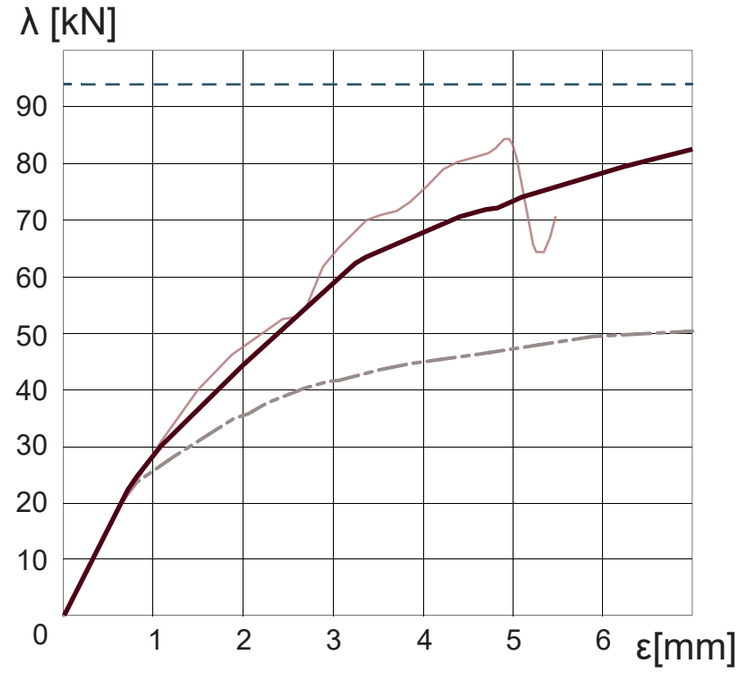


Application of FRP

Cutoff Bars

Very high f_T
$f_C = 0$





Conclusions:

NTM model → 45° PH, conserv. λ

f_T + orthotropy → smeared PH, accurate λ

FRP model by CoB → 2λ increase

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