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Etude de la vulnérabilité sismique des constructions en terre crue: modélisation par macro-éléments

Study of the seismic vulnerability of adobe masonry constructions: modeling with macro-elements

Equipe RV

Context

Seismic vulnerability of masonry structures

Different modes of failure: out-of-plane displacement, Shear/sliding, tensile breaking, crushing



Methods for seismic sustainability

Horizontal bands either in wood, concrete or stone can be used to partition the wall

Recognized seismic sustainability effect but never deep studied nor optimized

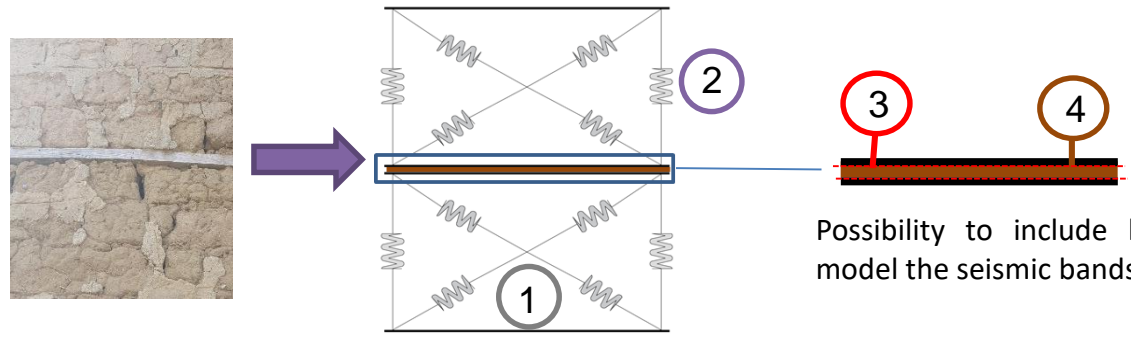


Construction with visible seismic bands

Method

Use of macro-elements to reduce time of calculations and model full scale 3D structures

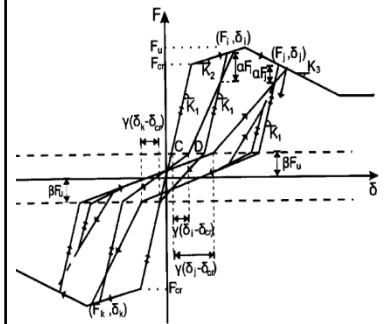
The macro-element has to be able to reproduce the behavior of masonry under cyclic and seismic solicitations (days of calculations for micro-models).



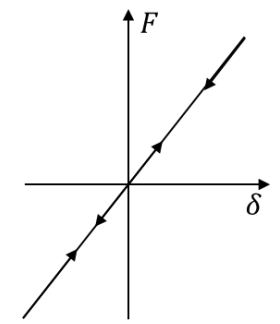
Possibility to include horizontal elements to model the seismic bands

Possibility to use one macro-element or several ones for a same masonry piece

1 Shear and energy dissipation behavior



2 and 4 Elastic behavior for shear bands and masonry in tension/compression



3 Sliding between masonry and shear bands

