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Titolo Tesi: Analisi non lineare di pareti murarie sotto azioni orizzontali: modellazione a telaio equivalente.

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SUMMARY

The strongly inelastic behaviour of masonry panels makes inadequate any kind of linear static analyses, and for this reason, both for academic and practical purposes, engineers have to deal with non-linear analyses of masonry buildings.

On top of that, the need for non-linear static procedures (NSP) also arises as a consequence of the performance-based earthquake engineering concepts, that generally require the comparison of the seismic demand with the building capacity, expressed in terms of displacements.

Within this framework, the choice of the appropriate models to use is fundamental matter: on one hand, the need for accurate predictions of the structural response leads to the adoption of very complex FEM models but, on the other and, the high computational skills and the very time-consuming analyses suggest the adoption of simplified models, such as the equivalent frame approach.

The equivalent frame models are not novel for the analysis of masonry structures, but the actual potentialities have not yet been completely studied, particularly for non-linear applications.

In the present thesis an effective tool for the non-linear static analysis of 2D masonry walls is presented, namely the software FREMA (Equivalent **FR**am**E** Analysis of **MA**sonry Structures) developed by the author.

In this work, the main innovative features of the proposed model (spread plasticity approach, displacement-driven loading process, accurate moment-curvature law for piers in rocking, flexural strength of spandrels) are discussed and an extensive validation of the model has been carried out by means of a comparison with experimental tests and accurate FEM models available in literature.