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**SHEAR STRENGTHENING OF MASONRY  
WALLS BY FRP LAMINATES:  
EXPERIMENTAL INVESTIGATION AND  
NUMERICAL ANALYSIS**

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## Abstract

The present Doctoral Thesis reports a detailed study on the contribution of FRP composites to the shear strength of masonry walls under in-plane seismic actions.

An introduction to typical damages of masonry due to in-plane seismic actions is firstly presented. Strengthening techniques, both traditional and innovative, against in-plane damage of masonry walls are also described.

Code provisions and analytical models on the shear strength of masonry walls externally strengthened by FRP composites are introduced.

The complete description of a database of experimental results collected by the author of the present thesis is presented considering tests on unstrengthened and strengthened masonry walls. The assessment of the analytical models is finally reported through the comparison between experimental and theoretical results.

A numerical model for masonry walls strengthened by FRP composite, developed by the author, is presented within the framework of the finite element method. The mathematical and physical characterisation, the assessment and the validation of the proposed numerical model for unstrengthened and strengthened model is finally presented, including its parametric assessment.