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# A Simple Model for Damage Analysis of a Frame-Masonry Shear-Wall System

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## Abstract

This paper is aimed at evaluating dissipation and deformation capacities of frame-masonry shear-wall systems in post-cracking regime. A simple planar model consisting of a cracked masonry shear-wall, containing a centered window, confined on three sides by a portal frame, is formulated. Kinematics is linear and accounts for an “overall shear mode” and “local sliding modes”, these latter describing relative motions among the cracked parts of the wall. A periodic horizontal force, roughly representative of the seismic actions, is acting at the top of the portal frame. An isotropic nonlinear damage law is adopted, and an Extended Galerkin-based variational formulation is followed to derive a low-dimensional discrete system. An ad-hoc resolution algorithm, based on a predictor-corrector scheme, is implemented, and numerical results discussed.

*Keywords:* Infill masonry framed, Nonlinear analysis, Simple discrete model, Shear post-cracking behavior, Elastic-damage, Linear softening.

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## 1. Introduction

Reinforced concrete frame constructions are very popular all over the world. In these kind of structures the infills play an important role in the mechanical

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