

International Doctorate in Civil and Environmental Engineering

Structural models for romanesque and renaissance masonry domes subjected to vertical and horizontal actions

PhD Student: Francesco Barsi

Info	
Home Institution	University of Florence
Joint Supervision	Laboratoire GSA, ENSA Paris-Malaquais, Université Paris-Est
Italian Tutor/Co Tutor	Prof. Stefano Bennati, Prof. Riccardo Barsotti
Foreign Tutor/Co Tutor	Prof. Thierry Ciblac
Email	francesco.barsi@unifi.it

Abstract
<p>Arches, vaults and domes represent some of the most commonly used structural elements in historical masonry constructions. In many cases these same elements hold great historical, artistic and architectural interest, dating back to hundreds, in some cases to thousands, of years ago. Considerable and ever-increasing attention has been paid to their conservation, especially in recent decades. From this point of view, it is evident the need to develop effective analysis methods to assess their ability to resist vertical actions and, most notably, horizontal actions, as they are the most insidious. The task is not easy, given the complex mechanical response of the masonry which is strongly dependent on a large number of mechanical and geometric parameters, such as, for example, the nature of the material, the texture and the characteristic dimensions of the elements of which it is composed. The aim of the research is to contribute to the development of analytical and numerical methods for the evaluation of the mechanical response of romanesque and renaissance masonry domes subjected to both vertical and horizontal loads. The goal is to provide, in some case studies, a sufficiently accurate estimate of the bearing capacity towards actions that can be thought of, at least as a first approximation, as representative of those generated in an earthquake.</p>