

COLLAPSE ANALYSIS OF MASONRY ARCH BRIDGES: NEW NUMERICAL MODELS AND STRUCTURAL APPLICATIONS

ABSTRACT:

The collapse limit of masonry arch bridges is one of the standard approaches to their structural safety. From a mechanical perspective, difficulties in identifying the collapse mechanism depend on the interaction between arch, backfill, spandrels, piers and soil. The material inhomogeneity, orthotropy and its non-linear response are responsible of further difficulties. Several numerical approaches, based on different representation scales and mechanical assumptions, have been proposed: while two-dimensional approaches are commonly used, but do not take into account many of the mechanical issues, 3D modelling is required to consider many crucial phenomena, such as the arch-spandrel interaction. For these cases, new numerical methods for the assessment of masonry arch bridges are currently under study.

The aim of this session is to facilitate interconnection and knowledge transfer between researchers and practitioners by focusing on innovative numerical methods and modelling techniques for the assessment of masonry arch bridges, as well as applications to real structures. Computational strategies for masonry bridges (limit analysis, non-linear static and dynamic approaches) and structural applications are welcome.

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