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## Limit analysis of masonry arch bridges subject to static and seismic actions

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### ABSTRACT

With the hypothesis of no tension strength, the rigid-perfectly plastic behaviour is considered for masonry and an iterative procedure is implemented in order to determine the collapse mechanism and the collapse load multiplier. The geometric and mechanic features of the arch are described through dimensionless parameter. Firstly, the single arch behaviour under vertical travelling loads is studied. Then, the model is applied to a single arch subjected to longitudinal horizontal actions, simulating the seismic actions. Finally, the two span arch bridge is analysed, introducing the behaviour of multi-span masonry arch bridges. The non-structural elements do not contribute to withstand the external actions, while different models are considered for the backfill-arch interaction when seismic actions are applied. The analysis is limited to the onset of the mechanism and the value of vertical travel load and horizontal seismic load inducing a mechanism is evaluated also analysing the influence of different geometric parameter. The results are compared to those obtained assuming an infinite compression resistance.