A new approach to model softening in quasi-brittle materials

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In quasi-brittle materials, such as reinforced concrete, masonry and glass, localisation of initially diffuse cracking is difficult to model. The use of conventional iterative methods such as the Newton-Raphson and arc-length methods, can lead to convergence difficulties, often hard to overcome. Other non-iterative techniques, such as the Sequentially Linear Approach, although robust, do not correctly approximate the governing material law. In the present work, a new method is introduced, designated the Total Iterative Approach, in which the internal damage variables are updated iteratively. This approach has proven to be a powerful tool for the analysis of softening behaviour: it is both robust and correctly approximates the material law. Some examples are presented to illustrate the performance of the model.

References

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