Nonlocal damage models for masonry structures

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Nonlocal damage models have been successfully used to alleviate the stress locking and mesh dependence observed in simulations of concrete or masonry structures that utilize local damage models. In nonlocal damage models, the characteristic length, which defines the radius of the interaction area, is a very important material dependent parameter. In the literature it has been proposed to evaluate the characteristic length from fracture energy criteria (Shah, 1995). This talk will focus on (1) application of nonlocal damage models in finite element simulation of concrete masonry walls, and (2) the identification of the characteristic length and other model parameters. The damage model used in this work is based on the two scalar damage model first proposed by Mazars (1989). This model is designed to capture the damage of brittle materials (in a continuum damage approach) in both tension and compression. The model parameters are designed to provide a homogenized description of the behavior of a composite material. The model is quite versatile, captures the combined tension-compression damage, handles robustly stress reversals (cyclic loadings), but the price paid for this versatility is the lack of physical intuition about the specific model parameters.

References

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