Survey of evolving gradient damage models with different activity functions

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It is well-known that the local damage model is not able to ensure mesh-objective results in the nonlinear analysis of strain localization phenomena. In the gradient damage models the solution is determined by the internal length parameter and becomes insensitive to the applied mesh. However, when this parameter is constant as in the conventional gradient damage model, a spuriously broadened damage zone can occur. This undiserable effect can be eliminated when the internal length parameter changes into a function of the gradient activity interaction. Different options of the evolving length scale are shown in the simulations of concrete cracking.