

A fatigue damage model for seismic response of RC structures

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Abstract-

Numerous damage models have been developed in order to analyze seismic behavior. Among the different possibilities existing in the literature, it is very clear that models developed along the lines of continuum damage mechanics are more consistent with the definition of damage as a phenomenon with mechanical consequences because they include explicitly the coupling between damage and mechanical behavior. On the other hand, for seismic processes, phenomena such as low cycle fatigue may have a pronounced effect on the overall behavior of the frames and, therefore, its consideration turns out to be very important. However, most of existing models evaluate the damage only as a function of the maximum amplitude of cyclic deformation without considering the number of cycles. In this paper, a generalization of the simplified model proposed by Cipollina et al. [Cipollina A, L´pez-Hinojosa A, Fl´rez-L´pez J. *Comput Struct* 1995;54:1113–26] is made in order to include the low cycle fatigue. Such a model employs in its formulation irreversible thermodynamics and internal state variable theory.

Index Terms- Continuum damage mechanics Low cycle fatigue Reinforced concrete

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