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Probabilistic Robustness Assessment of Structures under Sudden Column-Loss Scenario

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Abstract : This paper presents a probabilistic incremental dynamic analysis (IDA) of a full reinforced concrete building subjected to column loss scenario for the assessment of progressive collapse. The IDA is chosen to explicitly account for uncertainties in loads and system capacity. Fragility curves are developed to predict the probability of progressive collapse given the loss of one or more columns. At a broader scale, it will also provide critical information needed to support the development of a new generation of design codes that attempt to explicitly quantify structural robustness.

Keywords : fire, nonlinear incremental dynamic analysis, progressive collapse, structural engineering
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