

Numerical Simulation Analysis of Reinforced Concrete Structure Using VFIFE Fiber-Element Model

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ABSTRACT

In this paper, a vector form intrinsic finite element (VFIFE or V-5) method is used to compute the nonlinear responses of reinforced concrete (RC) structure. In addition, the fiber-element model of VFIFE frame element (FEVFE) is formulated. Material models of both concrete and steel on the cross section of the member are considered. The VFIFE method is a particle-based method. They have three key VFIFE processes such as the point value description, path element and convected material frame [1]. Thus, the RC structure is represented by finite particles. Each particle is subjected to the external forces and internal forces. The particle satisfies the Newton's Law. A fictitious reversed rigid body motion is used to remove the rigid body motion from the deformations of the element [2]. The internal forces of the element in deformation coordinates satisfy the equilibrium equations. Comparing the results of numerical simulations and experiments of the reinforced concrete members subjected to external loads, the proposed method demonstrate accuracy and efficiency.

REFERENCES

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