

## Crack Width Analysis of Reinforced Concrete Members under Shrinkage Effect by Pseudo-Discrete Crack Model

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**Abstract :** Crack caused by shrinkage movement of concrete is a serious problem especially when restraint is provided. It may cause severe serviceability and durability problems. The existing prediction methods for crack width of concrete due to shrinkage movement are mainly numerical methods under simplified circumstances, which do not agree with each other. To get a more unified prediction method applicable to more sophisticated circumstances, finite element crack width analysis for shrinkage effect should be developed. However, no existing finite element analysis can be carried out to predict the crack width of concrete due to shrinkage movement because of unsolved reasons of conventional finite element analysis. In this paper, crack width analysis implemented by finite element analysis is presented with pseudo-discrete crack model, which combines traditional smeared crack model and newly proposed crack queuing algorithm. The proposed pseudo-discrete crack model is capable of simulating separate and single crack without adopting discrete crack element. And the improved finite element analysis can successfully simulate the stress redistribution when concrete is cracked, which is crucial for predicting crack width, crack spacing and crack number.

**Keywords :** crack queuing algorithm, crack width analysis, finite element analysis, shrinkage effect

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