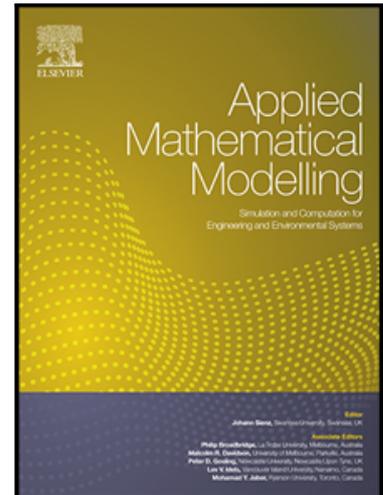


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Highlights:

1. A fast successive relaxation updating method for continuous-discontinuous cellular automaton(CDCA) is proposed.
2. A fast CDCA is developed, and increments of displacement and nodal force are enlarged by the accelerating factor.
3. A new discontinuity tracking method which combines cell space cutting and cell neighbor searching is proposed.
4. The optimal value of the accelerating factor is studied, and an adaptive iteration scheme is proposed.

Abstract

Because of its local property, cellular automaton method has been widely applied in different subjects, but the main problem is that the cellular updating is time-consuming. In order to improve its calculation efficiency, a fast successive relaxation updating method is proposed in this paper. Firstly, an accelerating factor ω is defined, and a fast successive relaxation updating theory and its corresponding convergence conditions are developed. In each updating step, the displacement

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