A Multi-Time-Step Method for

Partitioned Time Integration of Peridynamics

P. Lindsay[†], M.L. Parks*, A. Prakash[†]

[†] Lyles School of Civil Engineering
Delon and Elizabeth Hampton Hall of Civil Engineering,
550 Stadium Mall Drive, West Lafayette, IN 47907-2051
{plindsay, aprakas}@purdue.edu
engineering.purdue.edu/~aprakas

[*] Sandia National Laboratories,
P.O. Box 5800, MS 1320,
Albuquerque, NM 87185
mlparks@sandia.gov
www.sandia.gov/~mlparks

ABSTRACT

Peridynamics is a nonlocal reformulation of continuum mechanics that is suitable for representing deformations with discontinuities, see [1, 2] and the references therein. We extend the peridynamic formulation to allow the use of multiple time steps within a single problem domain by decomposing that domain into a number of smaller subdomains, where the critical regions of interest are solved using a small time step and the rest of the problem domain is solved using a larger time step. We explore the numerical properties and computational cost of the proposed approach, and demonstrate through numerical examples that a multi-time-step discretization of peridynamics can be solved much faster than a uniform time step discretization, and without adversely affecting the accuracy of the computed solution [3].

REFERENCES

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