

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Cascading failures in interdependent lattice networks: from first order to second order phase transition¹ WEI LI, Center for Polymer Studies and Department of Physics, Boston University, Boston, MA 02215 USA, AMIR BASHAN, Department of Physics, Bar-Ilan University, Ramat-Gan 52900, Israel, SERGEY BULDYREV, Department of Physics, Yeshiva University, 500 West 185th Street, New York, New York 10033, USA, EUGENE STANLEY, Center for Polymer Studies and Department of Physics, Boston University, Boston, MA 02215 USA, SHLOMO HAVLIN, Department of Physics, Bar-Ilan University, Ramat-Gan 52900, Israel — We study a system composed of two interdependent lattice networks A and B, where nodes in network A depend on a node within a certain shuffling distance r of its corresponding counterpart in network B and vice versa. We find, using numerical simulation that percolation in the two interdependent lattice networks system shows that for small r the phase transition is second order while for larger r it is a first order.

¹We wish to thank DTRA for financial support and Dr. Robin Burk for encouraging discussions. We acknowledge the partial support of this research through the Dr. Bernard W. Gamson Computational Science Center at Yeshiva College.

Wei Li
Center for Polymer Studies and Department of Physics,
Boston University, Boston, MA 02215 USA

Date submitted: 27 Nov 2011

Electronic form version 1.4