Scaling in earthquake models with inhomogeneous damage

RACHELE DOMINGUEZ, Randolph-Macon College, KRISTY TIAMPO, University of Western Ontario, C.A. SERINO, W. KLEIN, Boston University

— We study the scaling of earthquake models that are variations of Olami-Feder-Christensen and Burridge-Knopoff models, in order to explore the effect of spatial inhomogeneities on earthquake-like systems when interaction ranges are long, but not necessarily longer than the distances associated with the inhomogeneities of the system. For long ranges and without inhomogeneities, such models have been found to produce scaling similar to GR scaling found in real earthquake systems. In the earthquake models discussed here, damage is distributed inhomogeneously throughout and the interaction ranges, while long, are not longer than all of the damage length scales. We find that the scaling depends not only on the amount of damage, but also on the spatial distribution of that damage.

This work was funded by the DOE through grant DE-FG02-95ER14498 and the NSERC and Aon Benfield/ICLR Industrial Research Chair in Earthquake Hazard Assessment.

Rachele Dominguez
Randolph-Macon College

Date submitted: 14 Oct 2011