Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Theory of deflagration in disordered media MAURO SCHIULAZ, Department of Physics, University of Washington, Seattle, WA 98195, USA, CHRISTOPHER R. LAUMANN[1], Department of Physics, Boston University, Boston, MA, 02215, USA, ALEXANDER V. BALATSKY[2], Institute for Materials Science, Los Alamos, NM 87545, USA, BORIS Z. SPIVAK, Department of Physics, University of Washington, Seattle, WA 98195, USA — The conventional theory of burning works well in the case of uniform media where all system parameters are spatially independent. We develop a theory of burning in disordered media. In this case, rare regions (hot spots) where the burning process is more effective than on average may control the heat propagation in an explosive sample. We show that most predictions of the theory of burning are quite different from the conventional case. In particular, we show that a system of randomly distributed hot spots exhibits a dynamic phase transition, which is similar to the localization transition. Depending on parameters of the system the phase transition can be either first or second order. These two regimes are separated by a tricritical point. The above results may be applicable to dynamics of any over-heated disordered system with a first order phase transition.

[1]Department of Physics, University of Washington, Seattle, WA 98195, USA
[2]Nordita, Center for Quantum Materials, KTH Royal Institute of Technology and Stockholm University, Roslagstullsbacken 23, SE-106 91 Stockholm, Sweden

Mauro Schiulaz
Department of Physics, University of Washington, Seattle, WA 98195, USA

Date submitted: 10 Nov 2016 Electronic form version 1.4