Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

**Global and local threshold in a metapopulational SEIR model with quarantine**[1] MARCELO F.C. GOMES[2], LUCA ROSSI, ANA PASTORE Y PIONTTI, ALESSANDRO VESPIGNANI, Department of Physics, College of Computer and Information Sciences, Bouve' College of Health Sciences, Northeastern University — Diseases which have the possibility of transmission before the onset of symptoms pose a challenging threat to healthcare since it is hard to track spreaders and implement quarantine measures. More precisely, one main concerns regarding pandemic spreading of diseases is the prediction–and eventually control–of local outbreaks that will trigger a global invasion of a particular disease. We present a metapopulation disease spreading model with transmission from both symptomatic and asymptomatic agents and analyze the role of quarantine measures and mobility processes between subpopulations. We show that, depending on the disease parameters, it is possible to separate in the parameter space the local and global thresholds and study the system behavior as a function of the fraction of asymptomatic transmissions. This means that it is possible to have a range of parameters values where although we do not achieve local control of the outbreak it is possible to control the global spread of the disease. We validate the analytic picture in data-driven model that integrates commuting, air traffic flow and detailed information about population size and structure worldwide.

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Date submitted: 11 Dec 2012 Electronic form version 1.4