Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Reaction-Diffusion Processes on Networks KYUNGSIK KIM, Department of Physics, Pukyong National University, Pusan 608-737, Korea , SOONHYUNG YOOK, Department of Physics and Research Institute for Basic Sciences, Kyung Hee University, Seoul 130-701, Korea, SOO YONG KIM, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon 305-701, Korea, KI-HO CHANG, Global Environment System Research Laboratory, National Institute of Meteorological Research, KMA, Seoul 156-720, Korea — We study the novel reaction-diffusion process of three-species on scale-free networks, which is significantly different from the numerical calculation manipulated on regular and small-world lattices. The inverse particle density for three-species process scales as the power-law behavior with $\alpha = 1.5$ for $\gamma > 3$. However we find that the inverse particle density scales in a different way depending on time t when $\gamma < 3$. In the early time regime, $\alpha \simeq 1.5$ but the inverse particle density increases exponentially as time increases. We also discuss the possible relationship to the dynamical properties of random walks. Particularly, we measure the ratio between the number of inactive and active bonds which shows the segregation of the particles.

Kyungsik Kim
Department of Physics, Pukyong National University, Pusan 608-737, Korea

Date submitted: 05 Nov 2007 Electronic form version 1.4