

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Simulation of nonlinear pattern formation dynamics in photoinduced structure change¹ KUNIO ISHIDA, Corporate R&D Center, Toshiba Corporation, Japan, KEIICHIRO NASU, Institute of Materials Structure Science, KEK, Japan — We study the nonlinear dynamics of pattern formation triggered by injection of photoexcited states. In order to describe the nonadiabatic transition during the relaxation process, we employ a model of localized electrons coupled with a fully quantized phonon mode, and the time-dependent Schrödinger equation for the model is numerically solved. We found that the photoinduced nucleation process is switched on only when certain amount of excitation energy is supplied in a narrow part of the system, i.e., there exists a smallest cluster of excited molecules which makes the nucleation possible. As a result, the portion of the cooperatively converted molecules is nonlinearly dependent on the photoexcitation strength, which has been observed in various materials.

¹This work was supported by the Next Generation Super Computing Project, Nanoscience Program, MEXT, Japan.

Kunio Ishida
Corporate R&D Center, Toshiba Corporation

Date submitted: 29 Nov 2007

Electronic form version 1.4