

Abstract Submitted  
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**Simulation of nonlinear pattern formation dynamics in photoinduced structure change**<sup>1</sup> 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.

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