

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Crystallization of supercooled liquids TAKASHI ODAGAKI, YU-UNA SHIKUYA, Tokyo Denki University — We investigate the crystallization process on the basis of the free energy landscape (FEL) approach to non-equilibrium systems. In this approach, the crystallization time is given by the first passage time of the representative point arriving at the crystalline basin in the FEL. We devise an efficient method to obtain the first passage time exploiting a specific boundary condition. Applying this formalism to a model system, we show that the first passage time is determined by two competing effects; one is the difference in the free energy of the initial and the final basins, and the other is the slow relaxation. As the temperature is reduced, the former accelerates the crystallization and the latter retards it. We show that these competing effects give rise to the typical nose-shape form of the time-temperature transformation curve and that the retardation of the crystallization is related to the mean waiting time of the jump motion.

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Date submitted: 13 Nov 2013

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