14. /3 ORDERING PROCESS IN A QUENCHED TRICRITICAL SYSTEM

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The ordering kinetics in a tricritical system is studied for a model equation suitable for binary alloy such as Fe-Al mixture. The model consists of a coupled set of equations for the local order parameter field $S(\underset{\sim}{r},t)$ and the local concentration $X(\underset{\sim}{r},t)$ and reads

$$\partial_t S(\underset{\sim}{r},t) = - M \frac{\delta F\{S,X\}}{\delta S}$$

$$\partial_t X(\underset{\sim}{r},t) = L\underset{\sim}{\nabla}^2 \frac{\delta F\{S,X\}}{\delta X}$$

where

$$F\{S,X\} = \int d\underset{\sim}{r}\left[\frac{h}{2}(\underset{\sim}{\nabla}X)^2 + \frac{k}{2}(\underset{\sim}{\nabla}S)^2 + W(S,X)\right]$$

$$W(S,X) = \frac{a}{2}X^2 - \frac{b}{2}S^2 + \frac{g}{4}S^4 + \frac{f}{2}S^2X^2 - \mu X$$

All the coefficients a,b$\cdots$ are chosen to be positive. The potential W(S,X) exhibits triple minima for $2bf > ag$ and for an appropriate choice of the chemical potential μ.

We have solved the above set of equations numerically in two dimensions with a periodic boundary condition. The parameters and the initial values for X and S are chosen to simulate the following three quenches:
(1) from the disordered state at high temperatures to the ordered state between the second order transition line and the coexistence line.
(2) from the ordered state to the inside of the coexistence line.
(3) from the disordered state to the inside of the coexistence line.
We have observed the time evolution of the domain growth and have performed the scaling analysis of the scattering functions for X and S. The details will be described at the conference.