

Short-Time Critical Behavior Affected by Weakly Long-Range Interactions

CHEN Yuan,¹ GUO Shuo-Hong¹ and LI Zhi-Bing^{1,2}

¹ Department of Physics, Zhongshan University, Guangzhou 510275, China

² Associate Member of ICTP, Trieste, Italy

(Received: 2000-4-17; Revised:)

Abstract: The theoretic renormalization group approach is applied to the study of short-time critical behavior of the Ginzburg-Landau model with weakly long-range interactions $p^{\sigma} s_p s_{-p}$. The system initially at a high temperature is firstly quenched to the critical temperature T_c and then released to an evolution with a model A dynamics. A double expansion in $\epsilon=2\sigma-d$ and $\alpha=1-\sigma/2$ with α of order ϵ is employed, where d is the spatial dimension. The asymptotic scaling laws and the initial slip exponents θ' and θ for the order parameter and the response function respectively are calculated to the second order in ϵ for σ close to 2.

PACS: 64.60.Ht, 05.70.Ln

Key words: Ginzburg-Landau model, short-time critical dynamics, weakly long-range interactions

[\[Full text: PDF\]](#)

Close