Lässig and Kinzelbach Reply: Kar

The scales \( r_0 \) and \( t_0 \) characterize the onset of roughness [4]. We write \( w^2(t) = w^2_0(t)W[r_0(t)/L, r_0(t)] \) and \( r^2(t) = r^2_0(t)R[r_0(t)/L, r_0(t)] \). The asymptotic scaling characterized by Eqs. (1)–(3) emerges only if all arguments of the crossover functions \( W \) and \( R \) are small. Numerical simulations in low dimensions show clear evidence of a scaling regime (of size \( L/r_0 \sim 10^d \) in \( d = 1 \) for the data of Ref. [5] at \( L = 3000 \)). With increasing dimension, however, the available system sizes decrease and for the solid-on-solid model, \( r_0 \) increases. The data of Refs. [2] and [3] for \( d = 4 \) have a “scaling regime” of less than half a decade \( (L/r_0 \sim 10^{0.4} \) at \( L = 100 \) [2,6] and \( r_{\text{max}}/r_0 \sim 10^{0.5} \) even if \( r_0 \sim 1 \) at low temperatures [3]). For \( d > 4 \) [2], not even the onset of scaling is reached \( (L < r_0) \). Hence, these data are insensitive to the alternative of Eqs. (2) and (3).

The leading lattice correction to scaling for the solid-on-solid model can be obtained from a continuum equation

\[
\partial_t h = \nu \nabla^2 h + \frac{\lambda}{2} (\nabla h)^2 + \eta + \mu \sin h,
\]

with an extra term that breaks the invariance under translations of \( h \). For \( d \approx d_\ast \), where \( h(r, t) \) has logarithmic corrections, we expect the vertex operators \( \exp(\pm i h(r, t)) \) to become scaling fields, just as for Gaussian surfaces \( (\lambda = 0) \) in \( d = 2 \). We denote by \( y \) the scaling dimension of the conjugate coupling \( \mu \). As long as \( y < 0 \) (which is the case for the model of Ref. [2]), we then have a power-law correction \( W \sim 1 + O((t/t_0)^{y/2}) \) for \( t_0 \leq t \ll t_0(L/r_0)^2 \) to the logarithmic scaling of Eq. (2) which may indeed explain the upward curvature in the double-logarithmic plot of \( w^2(t) \) in [2]. We stress again that these lattice effects persist in the limit \( L \to \infty \), unlike the initial-time oscillations of \( w^2(t) \) [2]. The periodic driving force may even turn relevant (i.e., \( y > 0 \)) for different model parameters. In that case, the lattice model has a roughening transition at zero temperature, which does not exist for the continuum system at \( \mu = 0 \).

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Michael Lässig\(^1\) and Harald Kinzelbach\(^2\)
\(^1\)MPI für Kolloid- und Grenzflächenforschung
Kantstrasse 55
14513 Teltow, Germany
\(^2\)Universität Heidelberg, Institut für theoretische Physik
Philosophenweg 19
69120 Heidelberg, Germany

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[4] The crossover from lattice-dominated to rough growth has recently been studied in detail for a related model. See H. Kallabis \textit{et al.}, Int. J. Mod. Phys. B (to be published).
[6] For \( w^2(t) \), scaling sets in at \( t_0 \approx 10^2 \) [given by \( w^2(t_0) = 1 \)] and the finite-size saturation is at \( t_c \approx 10^{3.4} \) [satisfying \( r_0(t_c) \approx L \)]. Then \( L/r_0 \sim (t_c/t_0)^{1/2} \sim 10^{0.4} \).