Understanding pending features of the KPZ class in discrete growth models

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This talk is divided in three parts. In the first one, we show that the theoretical machinery developed for the KPZ class in low dimensions are obeyed by the restricted solid-on-solid (RSOS) model for substrates with dimensions up to $d = 6$. Analyzing different restriction conditions, we show that height distributions of the interface are universal for all investigated dimensions. It means that uctuations are not negligible and, consequently, the system is still below the upper critical dimension at $d = 6$. The extrapolation of the data to dimensions $d \geq 7$ predicts that the upper critical dimension of the KPZ class is infinite. The second part is devoted to analysis of ballistic growth models in $d = 2 + 1$ dimensions, for which a clear evidence of expect KPZ universality class is not currently available. We show that a intrinsic width can be explicitly obtained in terms of finite-time corrections in KPZ ansatz. The physical origins of these corrections will be also presented. Finally, in the third part, we present simulations of KPZ models on substrates that expand laterally at a constant rate by duplication of columns. Despite of the null global curvature, we show that all investigated models have asymptotic height distributions and spatial covariances in agreement with those expected for the KPZ subclass for curved surfaces. The consequences of this equivalence will be discussed.