Abstract Submitted
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Scaling and distribution of the width in regular and small-world synchronization networks in 2D[1] HASAN GUCLU, GYORGY KORNISS, Rensselaer Polytechnic Institute, MARK A. NOVOTNY, Mississippi State University, ZOLTAN TOROCZKAI, Los Alamos National Laboratory — We study the evolution, the scaling and the steady-state distribution of the width in two-dimensional regular and small-world (SW) networks motivated by a synchronization problem in distributed computing [2] [3]. We find that in the regular network the system exhibits Kardar-Parisi-Zhang (KPZ) type roughening (de-synchronized state) with a very slow convergence to the KPZ width distribution. When SW links are added to the regular network one obtains a finite width in the thermodynamic limit (synchronized state). The distribution of the width in the SW network, however, is of non-Gaussian type with an exponential tale.

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[2]G. Korniss et al.,*Science* **299**, 677 (2003).
[3]H. Guclu and G. Korniss, *Phys. Rev. E* **69** 065104(R) (2004).

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