

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Order by geometrical disorder in a 2D quantum antiferromagnet**  
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State Physics, RWTH Aachen University — We consider the effects of random fluc-  
tuations in the local geometry on the ground state properties of a two-dimensional  
quantum antiferromagnet. We analyse the behavior of spins described by the Heisen-  
berg model as a function of what we call “phason flip disorder,” following a termi-  
nology used for aperiodic systems. The calculations were carried out both within  
linear spin wave theory and using quantum Monte Carlo simulations. An “order  
by disorder” phenomenon is observed in this model, wherein antiferromagnetism is  
found to be enhanced by phason disorder. The value of the staggered order pa-  
rameter increases with the number of defects, accompanied by an increase in the  
ground state energy of the system. We furthermore find a long-ranged attractive  
Casimir-like force between two domain walls of defects separated by a finite distance.

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Date submitted: 02 Dec 2011

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