1151-82-101 **Geoffrey Grimmett** and **Zhongyang Li*** (zhongyang.li@uconn.edu), 341 Mansfield Road, Unit 3009, Storrs, CT 06268. *Phase Transitions in the 1-2 Model.*

A configuration in the 1-2 model is a subgraph of the hexagonal lattice, in which each vertex is incident to 1 or 2 edges. By assigning weights to configurations at each vertex, we can define a family of probability measures on the space of these configurations, such that the probability of a configuration is proportional to the product of weights of configurations at vertices. We study the phase transition of the model by investigating the probability measures with varying weights. We explicitly identify the critical weights, in the sense that the edge-edge correlation decays to 0 exponentially in the subcritical case, and converges to a non-zero constant in the supercritical case, under the limit measure obtained from torus approximation. These results are obtained by a novel measure-preserving correspondence between configurations in the 1-2 model and perfect matchings on a decorated graph, which appears to be a more efficient way to solve the model, compared to the holographic algorithm used by computer scientists to study the model. The major difficulty here is the absence of stochastic monotonicity. (Received August 11, 2019)