1116-00-1518 **Xiyang Luo*** (xylmath@gmail.com), 2143 Midvale Ave., Los Angeles, CA 90025, and **Andrea L Bertozzi**. *Convergence Analysis of the Graph Allen-Cahn Scheme.*

Graph partitioning problems have a wide range of applications in machine learning. This work analyzes convergence conditions for a class of diffuse interface algorithm [A.L. Bertozzi and A. Flenner, *Multiscale Modeling & Simulation*, 10(3):1090[1118, 2012.] for binary and multi-class partitioning. Using techniques from numerical PDE and convex optimization, convergence and and monotonicity is shown for a class of schemes under a graph-independent timestep restriction. We also analyze the effects of spectral truncation, a technique used to save computation cost. Convergence of the scheme with spectral truncation is also proved under a timestep restriction inversely proportional to the size of the graph. Moreover, this restriction is shown to be sharp in the worst case. Various numerical experiments are done to compare theoretical results with practical performance. (Received September 20, 2015)