1020-65-218   **Sung Ha Kang*** (`skang@ms.uky.edu`), 715 Patterson Office Tower, University of Kentucky, Lexington, KY 40506, **Yoon Mo Jung**, School of Mathematics, University of Minnesota, Minneapolis, MN 55455, and **Jainhong Shen**, School of Mathematics, University of Minnesota, Minneapolis, MN 55455. *Multiphase Image Segmentation via Modica-Mortola Phase transition.*

We propose a novel multiphase segmentation model built upon the celebrated phase transition model of Modica and Mortola in material sciences and a properly synchronized fitting term that complements it. The proposed sine-sinc model outputs a single multiphase distribution from which each individual segment or phase can be easily extracted. Theoretical analysis is developed for the Gamma-convergence behavior of the proposed model and the existence of its minimizers. Since the model is not quadratic nor convex, for computation we adopted the convex-concave procedure (CCCP) that has been developed in the literatures of both computational nonlinear PDEs and neural computation. Numerical details and experiments on both synthetic and natural images are presented. (Received August 28, 2006)