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Jackie J. Shen* (jshsen@math.umn.edu), 206 Church Street, SE, School of Mathematics, UMN, Minneapolis, MN 55455, and **Sung-Ha Kang** and **Yoon-Mo Jung**. *Multiphase Image Segmentation via Modica-Mortola Phase Transition*.

Partially inspired by the celebrated Mumford-Shah model in vision and imaging, we propose a novel multiphase image segmentation model built upon the well known 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 Γ -convergence behavior of the proposed model and the existence of its minimizers. Since the model is not quadratic nor convex, computationally adopted is 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. (Joint work with Sung-Ha Kang and Yoon-Mo Jung) (Received August 29, 2006)