1018-35-218   **Aaron Nung Kwan Yip*** (`yip@math.purdue.edu`), Department of Mathematics, 150 N. University Street, Purdue University, West Lafayette, IN 47907. *Structures of Local Minimizers of a One-Dimensional Higher Order Variational Problem.*

We present results on the structures of local minimizers of a one-dimensional variational problem. The energy functional under investigation is motivated by the study of coherent solid-solid phase transformations and the competition between the effects from the regularization and formation of small scale structures. All the local minimizers with low enough energy are shown to be periodic. This is due to some intricate interactions between the boundaries of different phases. (Received March 07, 2006)