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**Oleksandr Misiats\*** (om25@nyu.edu), 15 Washington pl, 4M, New York, NY 10003, and **Robert Kohn** and **Stefan Muller**. *Analysis of microstructures in martensite-austenite phase transitions using sharp variational bounds.*

We consider a variational problem of minimizing the sum of the surface and elastic energies of the order parameter  $u$  in a two-dimensional rectangular domain. This model, originally suggested by Kohn and Muller, comes from martensitic phase transitions, in which two distinct phases of the martensite correspond to  $u_y(x, y) = 1$  and  $u_y(x, y) = -1$ . In particular, minimizers develop self-similar microstructures in the case when the boundary condition is not compatible with either of the phases. In my talk, I will describe several patterns of the behavior of minimizers depending on the choice of boundary conditions, derive sharp global and local energy bounds, and discuss the applications to 2D and 3D elasticity models. (Received July 14, 2016)