1145-65-1948 **Julia A Dobrosotskaya*** (`julia.dobrosotskaya@case.edu`), Case Western Reserve University, Dept. of Math., Appl. Math. and Statistics, 2049 Martin Luther King Jr. Drive, Cleveland, OH 44106. *Anisotropic diffuse interface functionals based on multiscale multidirectional representations.*

We consider Laplacian-like diffusive operators based on sparse representation systems such as shearlets and composite dilation wavelets in 2D. The directional sensitivity of these systems allow for adaptive design of anisotropic behavior in the diffuse interface set-up analogous of the Ginzburg Landau functionals. The associated energies approximate weighted perimeter functionals (regular or anisotropic TV) in the variational sense, with minimizers exhibiting sharp phase transitions and little interface blur. They can be effectively utilized in creating data adaptive variational techniques for multipurpose image processing. We illustrate the theoretical findings with examples of image inpainting, segmentation and supperresolution. (Received September 24, 2018)