

**Concept Question 10-17:** Why does wavelet-based denoising work so much better than lowpass filtering?

Wavelet-based denoising computes the image whose wavelet transform minimizes the LASSO functional given by Eq. (10.163). Minimizing the LASSO functional produces an image whose wavelet transform is sparse, which is true for many real-world images. Lowpass filtering effectively models the image as having only low-wavenumber components, so features such as edges, which are high-wavenumber components, are eliminated by lowpass filtering. But these are often important image features,