Variational method of speckle reduction and boundary detection in SAR imagery

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In this paper we propose a variational method to delineate the boundary of objects in Synthetic Aperture Radar (SAR) images. An ERS PRI image over Proserpine area in Australia is used as an example. It is implemented by two steps. The first step is to reduce the multiplicative speckle noise. The second step is to delineate the boundary from the speckle reduced image obtained in Step 1. In each step, we define an energy functional. The minimum of the functionals correspond to the results of noise reduction and boundary delineation respectively. The results of both steps appear to be very promising. The same idea could be applied to polarimetric SAR images by changing corresponding functionals.