John J. Benedetto and Wojciech Czaja*, Department of Mathematics, University of Maryland, College Park, MD 20742, and Timothy Doster and Martin Ehler. Fusion of spatial and spectral features in hyperspectral imagery. Preliminary report.

As new remote sensing modalities emerge, it becomes increasingly important to find novel algorithms for fusion and integration of different data types for the purposes of target/anomaly detection or classification. In this presentation, we provide an overview of several new approaches to the spatial-spectral fusion problem in hyperspectral imagery. This problem emerges when classical spectral analysis is enriched by a detailed study of spatial distribution of features. The approaches we shall describe are rooted in harmonic analysis, and are based on creating novel fused representations of the spatial-spectral data, which are then subject to analysis by means of the state-of-the-art classifiers. Our approaches involve machine learning techniques based on analysis of joint data-dependent graphs and the resulting data-dependent fusion operators and their representations, as well as wavelet packet representations and nonlinear thresholding. (Received September 15, 2013)