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Alexander Cloninger and **Wojciech Czaja***, Department of Mathematics, University of Maryland, College Park, MD 20742, and **Timothy Doster**. *Operator-based Data Fusion*. Preliminary report.

Integration and fusion are among the longstanding objectives of data analysis. This problem may be formulated as a question about finding a suitable feature space in which different modes of information can be jointly embedded. The goal is to improve the outcome of analysis of this jointly embedded data, as compared to inferences made from individual sources. This is often possible due to complementarity of information contained in the separate modalities.

In our talk we shall present a deterministic approach to data fusion, which exploits fused representations of certain well known data-dependent operators. A classical example of such an operator is the data-dependent graph Laplacian. Through its eigendecomposition we introduce a novel notion of heterogeneous data fusion, which allows us to combine different graph structures arising from individual modalities, into one joint representation.

Our theory then can be applied to problems which include spatial-spectral fusion, or fusion of hyperspectral satellite imagery (HSI) with LIDAR data. We verify the results of our methods by utilizing them for the HSI classification problem. (Received September 17, 2013)