1056-58-2036 **Martin Ehler*** (ehlermar@math.umd.edu), Department of Mathematics, Mathematics Building, University of Maryland, College Park, MD 20742-4015, and **Wojciech Czaja** (wojtek@math.umd.edu), Mathematics Building, Department of Mathematics, University of Maryland, College Park, MD 20742-4015. *Schroedinger-Type Eigenmaps for the Analysis and Classification of Multispectral Data in Bio-Medical Imaging.*

We introduce a barrier potential for Schroedinger operators on a graph and discuss its use in the field of manifold recovery if a priori knowledge is available. The information content of high-dimensional data is often much lower than the dimension, and the data lies on a manifold that must be recovered. State-of-the-art dimension reduction and manifold recovery methods like Diffusion Maps, Diffusion Wavelets, Locally Linear Embedding, and Laplacian Eigenmaps are kernel-based and rely on spectral graph theory. These methods, however, are fully automated, which restrains the use of a priori knowledge about the manifold.

Based on the Laplacian kernel, we introduce a flexible barrier potential, that can capture additional labels, and obtain a Schroedinger type kernel. The result is a new Schroedinger Eigenmaps method that allows for input in an otherwise fully automated dimension reduction process.

This new tool is applied to multispectral fluorescence images of National Eye Institute study patients with retinal pathology, but could be usefully applied to a wide range of classification problems. (Received September 22, 2009)