

1128-05-229

**Tobias Hagge, Patrick Mackey, Kathleen Nowak, Carlos Ortize Marrero, Jenny Webster** and **Stephen J Young\*** ([stephen.young@pnnl.gov](mailto:stephen.young@pnnl.gov)). *The Geometric Spectrum of Graphs*. Preliminary report.

Recently, Mendel and Naor, Dumitriu and Radcliffe, and Radcliffe and Williamson have begun the study of what could be termed the geometric Fiedler vector (or spectral gap) for graphs. Their principle observation is that the functional form associated with the graph can be expressed in terms of the distance function on  $\mathbb{R}$ . We give a partial structural characterization of when the geometric Fiedler vector can be extended to a geometric spectrum. Additionally, we provide applications of the geometric spectrum to community detection in graphs. This is joint work with Tobias Hagge, Patrick Mackey, Kathleen Nowak, Carlos Ortiz Marrero, and Jenny Webster. (Received February 27, 2017)