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James Burke. *Variational properties of spectral functions with an application to matrix preconditioning.* Preliminary report.

Eigenvalue optimization problems arise in the control of continuous and discrete time dynamical systems. The spectral abscissa (largest real part of an eigenvalue) and the spectral radius (largest eigenvalue in modulus) are examples of functions of eigenvalues, or spectral functions, connected to these optimization problems. In 2001, Burke and Overton showed that the spectral abscissa is subdifferentially regular if and only if all active eigenvalues are nonderogatory. We extend this result to more general class of spectral max functions and explore applications of this result to matrix preconditioning. (Received September 25, 2012)