1043-53-69 **A Daniilidis**, **J Malick**, **A Lewis** and **H Sendov*** (`hssendov@stats.uwo.ca`), The University of Western Ontario, Western Science Centre - Room 262, Dept. of Statistical & Actuarial Sciences, London, Ontario N6A 5B7, Canada. *Spectral Manifolds.*

It is well known that the set of all $n \times n$ symmetric matrices of rank k is a smooth manifold. This set can be described as those symmetric matrices whose ordered vector of eigenvalues has exactly $n-k$ zeros. The set of all vectors in $\mathcal{R}^n$ with exactly $n-k$ zero entries is itself an analytic manifold.

In this work, we characterize the manifolds M in $\mathcal{R}^n$ with the property that the set of all $n \times n$ symmetric matrices whose ordered vector of eigenvalues belongs to M is a manifold. In particular, we show that if M is a C^2, C^∞, or C^ω manifold then so is the corresponding matrix set. We give a formula for the dimension of the matrix manifold in terms of the dimension of M.

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