Inverse Subspace Iteration for the Solution of a Class of Parameterized Eigenvalue Problems

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Parameterized eigenvalue problems arise from the analysis of the stability of dynamical systems. The eigenvalues are functions of the parameters. The parameter values for which eigenvalues cross the imaginary axis are often of interest, since they may introduce bifurcations. In this talk, we propose a method for computing several parameter values where eigenvalues are purely imaginary. This problem can be written as an eigenvalue problem of squared dimension which is obtained by a sum of Kronecker products. The method is based on inverse subspace iteration, that exploits special low rank structure in the eigenvectors. We show the effectiveness of the method by numerical examples.