

1057-15-434

Vadim O Sokolov* (vsokolov@anl.gov), 9700 S. Cass Avenue, Energy Systems Division, Argonne, IL 60439, and **Biswa Nath Datta**, NIU, Dept of Mathematical Sciences, DeKalb, IL 60115. *Numerical Methods for Quadratic Affine Inverse Eigenvalue Problem.*

The Quadratic Inverse Eigenvalue Problem (QIEP) is to find three matrices, M , C , and K , given a set of numbers and vectors, such that the given numbers become the eigenvalues of the matrix pencil $L(\lambda) = \lambda^2 M + \lambda C + K$ with the given vectors as the associated eigenvectors. The Quadratic Affine Inverse Eigenvalue Problem (QAIEP) has the additional requirement that the matrices M , C , and K must belong to an affine class of matrices, meaning that these are linear combinations of a given set of structured matrices.

In this talk, we consider the formulation and analysis of a locally quadratically convergent method and a globally convergent method for solving the QAIEP. We also describe how to modify the numerical methods to make them more efficient. The validity of the method is illustrated by means of a numerical example of spring-mass system. (Received January 26, 2010)