The vibrating elastic membrane is a classical problem in Mathematical Physics which arises in a wide variety of physical applications. Since the geometry of the membrane is usually well defined for a particular problem, determination of the nature of any nonhomogeneity is critical. The eigenvalues of particular membranes are often quite accessible experimentally and so a method for the determination of the nonhomogeneity based on the available eigenvalues is of practical importance.

Projection of the boundary value problem and its coefficients onto appropriate vector spaces leads to a matrix inverse problem. Although the matrix inverse problem is of nonstandard form, it can be solved by a fixed-point iterative method. Convergence of the method for a rectangular membrane is discussed and numerical evidence of the success of the method is presented.