The localization of Arnoldi Ritz values for real normal matrices

Gérard Meurant[1]

[1] *30 rue du sergent Bauchat, 75012 Paris*

Abstract

The Arnoldi algorithm is one of the most used method for computing eigenvalues of large non-symmetric matrices. In this talk we consider the problem of the localization of the Arnoldi Ritz values for real normal matrices. It is well known that they belong to the field of values which is the convex hull of the eigenvalues for a normal matrix. However, for real matrices the Ritz values are contained in smaller regions inside the field of values. We will derive characterizations of the Ritz values and we will use this to explain how to compute the boundaries of the region where they are located. We will show some numerical experiments for which this region has interesting shapes in the complex plane. This study is a step towards having a better understanding of Arnoldi Ritz values convergence.