

EINLADUNG

ZUM MATHEMATISCHEN KOLLOQUIUM

Es spricht

Herr Prof. Dr. Matthias Voigt
(UniDistance Suisse, Brig, Schweiz)

Zum Thema:

„Numerical Methods for Large-Scale Nonlinear Eigenvalue Problems“

Abstract:

Nonlinear eigenvalue problems arise in a large variety of applications such as the stability analysis of delay differential equations, the treatment of differential equations with nonlinear boundary conditions, or the modal analysis of vibroacoustic problems. In this talk, we will discuss numerical methods for nonlinear eigenvalue problems that are described by matrices of large dimension. Two techniques will be presented. The first one considers the eigenvalue problem in a Schur complement form and is based on projecting the large matrices in an interpolatory framework in order to obtain a reduced nonlinear eigenvalue problem that can be solved more efficiently. Based on the eigenpair residuals, new interpolation points and corresponding projection matrices can be computed. In this way, we obtain an iterative method for computing a few eigenvalues close to a desired target point. The second method we consider is the NLFEAST algorithm that is designed to compute all eigenvalues that are enclosed by a given contour. We will adapt this method to the particular application case of a nonlinear eigenvalue problem originating from a modal analysis in vibroacoustics and we will illustrate that this method is feasible for efficiently computing approximations to the resonance frequencies in a frequency band of interest. This is joint work with Rifqi Aziz and Emre Mengi (Koc University, Istanbul) as well as Suhaib Koji Baydoun, Benedikt Goderbauer, Christopher Jelich, and Steffen Marburg (TU Munich).

Dienstag, 17. Januar 2023, 17:00 Uhr, C 112

(Kaffee und Kekse, 16:30 Uhr, C 110)

Alle Interessierten sind herzlich eingeladen!

Ilmenau, 12.01.2023

Das Institut für Mathematik