Structured Matrix Polynomials: Linearization and Condensed Forms

V. Mehrmann
joint work with R. Byers and H. Xu

We discuss general and structured matrix polynomials which may be singular and may have eigenvalues at infinity. We derive condensed/canonical forms that allow (partial) deflation of the infinite eigenvalue and singular structure of the matrix polynomial. The remaining reduced order staircase form leads to new types of linearizations which determine the finite eigenvalues and corresponding eigenvectors. The new linearizations also simplify the construction of structure preserving linearizations in the case of structures associated with indefinite scalar products.