Analysis and numerical experiments connected with the computing of the GCD of two inexact polynomials

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The paper introduces the calculation of an approximate greatest common divisor of two univariate polynomials. Euclid's algorithm can be easily simulated by the reduction of the Sylvester resultant matrix to lower triangular form. In real situation the coeffcients of both polynomials are inexact and the questions to find a smallest perturbation of both polynomials to obtain the lowest rank of the perturbed Sylvester matrix are solved in many papers. A perturbed matrix is calculated using STLN algorithm. Even though the STLN algorithm has been intensively studied, the theoretical explanation of some parts of algorithm have not been in detail established and this is the first aim of the lecture together with further numerical experiments. Some theoretical questions connected with using QR-factorization for computing GCD will be in detail analyzed together with numerical experiments in the second part of the lecture.