

Gröbner Bases by Matrix Triangularization

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Using results by Hermann and Dubé we show how we can compute a Gröbner basis of a set F of polynomials over a field by building, in a first step, one big matrix of shifts of the polynomials in F and, then, triangularizing this matrix. We give a bound for the size of the matrix that does not depend on the term ordering. It depends on the highest degree of the polynomials in F , the number of variables and the number of polynomials in F . By the same approach, we also give a criterion for how to determine solvability of the system $F = 0$ with a bound for the matrix which is smaller than the bound used for Gröbner bases computation.

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