On Gröbner Bases in polynomial rings over Von Neumann regular rings - Abstract -

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A commutative ring R with the following property is called a Von Neumann regular ring:

$$\forall a \in R\, \exists b \in R\; a^2 b = a\,.$$

Gröbner bases of polynomial rings over such rings are first introduced in [9]. At the almost same time, we independently came up with the exactly same idea in [1]. The purpose of [9] was essentially simultaneous computations of Gröbner bases of a given finite set of polynomials in polynomial rings over different finite fields. On the other hand, our purpose was to provide Gröbner bases technique for boolean constraint solving. After that, our work have been developed in [3, 4, 5, 6] and a free software is opened in [2]. Recently we found that we can construct special types of comprehensive Gröbner bases as examples of Gröbner bases in polynomial rings over Von Neumann regular rings([7, 8]). In my talk, I will give a summary of a series of our work.

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