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On Homogenization SAGBI-Gröbner Bases in Invariant Rings

Marziyeh Boroujeni

University of Damghan

Iran

Among all polynomial ideals, homogeneous ideals have some nice properties, for example a Gröbner basis of a homogeneous ideal is homogeneous. Also, every reduced Gröbner basis with respect to lex ordering is a reduced Gröbner basis with respect to deglex ordering for a homogeneous ideal and conversely [1]. On the other hand any given non-homogeneous ideal can be converted to a homogeneous ideal by an extra variable. If we substitute the extra variable for one into any Gröbner basis of the homogeneous ideal, then we get a Gröbner basis for the first ideal [2]. This method for computing Gröbner bases is known as homogenization and dehomogenization. In this talk, we verify the homogenization and dehomogenization method on SAGBI-Gröbner bases in invariant rings that leads to compute SAGBI-Gröbner bases for homogeneous ideals.

This is a joint work with A. Basiri and S. Rahmany.

References

- [1] Adams, W., and Loustaunau, P. An Introduction to Gröbner Bases. Graduate studies in mathematics. American Mathematical Society, 1994.
- [2] Becker, T., and Weispfenning, V. Gröbner bases. Springer-Verlag, NewYork- Berlin-Heidelberg, 1993.