

Seminari de Geometria Algebraica 2010/2011 (UB-UPC)

Divendres 1 d'octubre a les 15 h. a l'aula T2 FM-UB

<http://atlas.mat.ub.es/sga>

Some uses of the Frobenius skew polynomial ring in tight closure theory

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This lecture is concerned with tight closure in a commutative Noetherian ring R of prime characteristic p . The *Frobenius homomorphism* $f : R \rightarrow R$ raises each element of R to its p th power. The *Frobenius skew polynomial ring over R* is the skew polynomial ring $R[x; f]$ associated to R and f in the indeterminate x over R .

The lecture will begin with a review of some basic definitions, ideas and examples from tight closure theory, but the main focus will be on the use of left $R[x; f]$ -modules to prove existence theorems about tight closure test elements. One could take the view that the lecture is about an application of non-commutative ring theory to commutative algebra. Particularly important will be the production of a suitable structure, as a left $R[x; f]$ -module, on the injective envelope of the simple R -module in the case where R is local (and satisfies additional conditions).
