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Branch Algebras

Branch groups were introduced by R. Grigorchuk in the 1980's, and may be described as groups almost (i.e. up to finite-index inclusions) isomorphic to a proper cartesian power of themselves.

Branch algebras, analogously, are algebras almost (i.e. up to finite-codimension inclusions) isomorphic to a matrix ring over themselves. The first example of such an algebra was studied by S. Sidki.

It is striking that there exist finitely generated such algebras. Furthermore, a concrete example is a graded algebra with Gelfand-Kirillov dimension 2, which I will describe in more detail: I will give a presentation for it, outline its structure as a Lie algebra, and list a few open problems concerning it and its generalizations.