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Noncommutative Version of Hochschild Cohomology

It is a celebrated result by Gerstenhaber from 1964 that (classical) Hochschild cohomology is graded commutative for any associative algebra. Suarez–Alvarez's elegant treatment of the categorical Eckmann–Hilton argument yields easily the same property for derived Hochschild cohomology as defined by Quillen. There is a canonical algebra homomorphism from classical to derived Hochschild cohomology that factors through the Yoneda algebra of the self-extensions of the given algebra as a bimodule over itself.

The question addressed here is whether the latter Yoneda algebra might also always be graded commutative. That is known under mild "Tor-transversality" conditions, when that algebra already coincides with the derived version of Hochschild cohomology. Here we give a simple example, the normalization of a plane cusp singularity, where the answer is negative. Indeed, the Yoneda Ext-algebra in that case is essentially an infinitely generated tensor algebra.