Nonarchimedean bornological algebras and their cyclic homology

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Let V be a complete discrete valuation domain with maximal ideal πV, fraction field $K = V[\pi^{-1}]$, and residue field $k = V/\pi V$. We are interested in developing a bivariant cohomology theory for k-algebras which takes values in K-vector spaces and has all the good properties (homotopy invariance, Morita invariance, excision, agreement with the relevant variant of de Rham cohomology in the commutative case, etc.). We assume that K has characteristic zero, but make no assumption on the characteristic of k; in fact the main case for us is $\mathrm{char}(k) = p > 0$. The general idea is to associate to each k-algebra A a (pro-) K-algebra $T(A)$ and take (some variant of) the periodic cyclic homology of $T(A)$. Such a construction already exists for commutative k-algebras of finite type; it yields Bertherlot's rigid cohomology, which is the correct variant of de Rham cohomology in this setting. In this talk I will explain a result we have interpreting rigid cohomology (made 2-periodic) of a commutative k-algebra A of finite type as the periodic cyclic homology of a certain pro-complete bornological K-algebra $T(A)$. Along the way I will discuss bornological V and K-algebras,

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