Alexander Petrov

Title: Periodic cyclic crystalline homology

Abstract: For a dg category C over a perfect field k of characteristics $p > 0$ we define a $W(k)$-linear invariant which lifts periodic cyclic homology of C over k and, if C itself admits a lift over $W(k)$ coincides with the periodic cyclic homology of a lift over $W(k)$(the situation being analogous to the behavior of crystalline cohomology of algebraic varieties). In particular, the periodic cyclic homology of a category over $W(k)$ only depends on the reduction of the category to k. The construction, inspired by Bhatt's computations of derived de Rham cohomology, is based on the existence of a flat connection on periodic cyclic homology of a family of categories. This invariant happens to coincide with the topological periodic cyclic homology of C(which is known to be a module over $W(k)$ which reduces to $HP(C/k)$ modulo p). This is a joint work with Vadim Vologodsky.