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*Factoring the Chern-Galois character and the homotopy invariance of Hochschild and cyclic complexes*

Goodwillie's Theorem states that the periodic cyclic homology is invariant under nilpotent extensions. We discuss a special type of nilpotent extensions of unital algebras (called row extensions) for which we prove a stronger result: the homotopy invariance of Hochschild and cyclic complexes. The row extensions appear in abundance. They are always H-unital but generically non-unital and noncommutative. A very specific type of a row extension appears naturally in the construction of the Chern-Galois character. If  $P$  is an algebra with a principal coaction, and  $B$  is its coaction-invariant subalgebra, then the Chern-Galois character factors through the row extension of  $B$  by the nilpotent ideal consisting of the invariant universal differential one-forms on  $P$ . When  $P$  is a principal comodule algebra, one can identify this ideal with the kernel of the multiplication map restricted to the algebra of the associated Ehresmann-Schauenburg quantum groupoid. Time permitting, we will explore advantages of our constructive homotopy approach to the Chern-Galois character. Based on joint work with Tomasz Maszczyk.