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Toward the primary conjecture

Hopf cyclic cohomology was invented by A. Connes and H. Moscovici to compute the local index cocycle associated to a hypoelliptic operator on the frame bundle twisted by the group of diffeomorphisms. The goal was to compute the cocycle in the Gelfand-Fuks cohomology of formal vector fields. To the speaker's knowledge, the only computation so far is done by the inventors in degree 1 to show the index cocycle is 1. There is a conjecture that states that the cocycle is made of primary classes. Toward this direction we associate a sequence of coalgebras to the Lie algebra of formal vector fields on the Euclidean space. We also introduce a Hopf algebra that acts on all coalgebras in the sequence. We compute the Hopf cyclic cohomology of some of the coalgebras to make sure the path is the right one. This is a collaboration with Serkan Sutlu.