

HOPF ALGEBRAS VIA GEOMETRIC INVARIANT THEORY

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Finite dimensional semisimple Hopf algebras over the complex numbers were studied substantially in the last decades.

They can be viewed as a generalization of finite groups. In fact, all known examples of such Hopf algebras can be constructed from some finite group theoretical data (they are what was called by Etingof, Nikshych and Ostrik "weakly group theoretical").

On the other hand, their classification seems to be out of reach at the moment.

In this talk I will describe how one can use tools from geometric invariant theory to study finite dimensional semisimple Hopf algebras. I will show that one can reduce the study of such Hopf algebras to the study of certain scalar invariants, which moreover can be described explicitly. I will then explain how these invariants relate to well known questions and constructions in Hopf algebras theory, and will explain how one can use invariant theory to prove a certain finiteness result (the finite number of Hopf orders).