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**Actions of Hopf algebras on noncommutative algebras**

An action of a finite-dimensional Hopf algebra $H$ on a noncommutative associative algebra $A$ is considered. Properties of $A^H$, the subalgebra of invariants in $A$, are studied. A lot of information is available in the case $A$ is commutative. We turn to noncommutative case. Some generalizations of results from [1] on integrality of extension $A/A^H$ are obtained for some classes of noncommutative algebras, in particular for the case when $A$ is integral over $Z(A)$, the centre of an algebra $A$.

Next the canonical action of $H$ on the tensor algebra $T(H)$ is considered. With the help of the technique developed some structure theorems for commutative Hopf algebras are proved: Let $H$ be a commutative finite-dimensional Hopf algebra and char $k = 0$ or $> \dim H$. If the coradical $H_0$ is a sub-Hopf algebra of $H$ or cocommutative, then $H$ is cosemisimple, i. e. $H = H_0$. In particular, a commutative pointed Hopf algebra with char $k = 0$ or $> \dim H$ is a group Hopf algebra. Also the example is constructed, showing that restrictions on char $k$ are necessary.

References: [1] A. Totok, Ob invariantakh konechnomernykh algebr Hopfa (On invariants of finite-dimensional Hopf algebras), *Vestnik MGU: Matematika, Mekhanika* **1997** N3, 31 – 34 (in russian). [2] A. Totok, Deistviya algebr Hopfa (Actions of Hopf algebras), *Matematichesky Sbornik* **189** (1998) N1, 149 – 160 (in russian).