Hopf Algebras and a Theorem of Larson and Sweedler

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Abstract

Let R be a Dedekind domain. A Hopf algebra over R is a commutative R-algebra H with some additional structure which makes H into a bialgebra with antipode $\sigma : H \to H$. If H has rank n as an R-module, and if H is cocommutative, then the linear dual H^* is also an R-Hopf algebra of rank n. There is a left H-module structure on H^* defined as $(h \cdot f)(k) = f(\sigma(h)k)$ for $h, k \in H$, $f \in H^*$. In this talk we prove the fundamental result of R. Larson and M. Sweedler which states that H^* is a locally free rank one H-module.