The Green ring of Taft algebras

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This talk is based on a joint work with Huixiang Chen and F. Van Oystaeyen.

We study the Green ring of Taft algebras $H_n(q)$, where n is a positive integer with $n \geqslant 2$, and q is an n-th root of unity. We first discuss the representations of Taft algebras. There are n^2 non-isomorphic finite dimensional indecomposable modules over $H_n(q)$, and all of them are uniserial. For each $1 \leqslant l \leqslant n$, there are n finite dimensional indecomposable $H_n(q)$-modules $M(l,r)$, $r \in \mathbb{Z}_n$, up to isomorphism. We show that every indecomposable projective $H_n(q)$-module is of dimension n. It turns out that the Green ring $r(H_n(q))$ of the Taft algebra $H_n(q)$ is a commutative ring generated by two elements subject to certain relations. Concrete examples for $n = 2, 3, \ldots, 8$ are given.