THE FIELDS INSTITUTE
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ABSTRACTS 1.2

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*Coverings of tame algebras**

Let A be a locally finite dimensional category over an algebraically closed field K of characteristic p, $\pi : B \to A$ be a Galois covering of A, and its Galois group G have no elements of order p. Then:

1. A is tame (wild) if and only if so is B.

2. Suppose that A (hence B) is tame. Then the categories of indecomposbale A-modules and B-modules are disjoint unions of the following shape:

$B\text{-}ind = B\text{-}ind_0 \sqcup B\text{-}ind_1$, where $Stab_G(M) = \{1\}$ for every $M \in B\text{-}ind_0$ and $Stab_G(M)$ is cyclic non-trivial for every $M \in \text{-}ind_1$. Moreover, $B\text{-}ind_1$ consists of homogeneous tubes.

$A\text{-}ind = A\text{-}ind_0 \sqcup A\text{-}ind_1 \sqcup A\text{-}ind_2$, where

(i) $A\text{-}ind_0 = \pi_*(B\text{-}ind_0)$; morover, $\pi_* : B\text{-}ind_0 \to A\text{-}ind_0$ is a Galois covering with the same group G;

(ii) $A\text{-}ind_1$ consists of direct sums of modules from $\pi_*(B\text{-}ind_1)$, every module $\pi_*(M)$, where $M \in B\text{-}ind_1$, has $|Stab_G(M)|$ non- isomorphic direct sumands, and $A\text{-}ind_1$ is also a union of homogeneous tubes;

(iii) $A\text{-}ind_2$ consists of families of homogeneous tubes, each family parametrized by K^*.

In particular, if M, N are indecomposbale B-modules or A-modules from different parts of this decomposition, then $Hom(M, N) = rad^\infty(M, N)$.

More complete information is also given about the structure of $A\text{-}ind_1$ and $A\text{-}ind_2$, as well as about homomorphisms between modules inside each part of this decomposition.

The technique used in the proof is that of boxes and reduction algorithms. Especially, the above assertions are first proved for representations of semi-free boxes, then the well-known relation between representations of boxes and algebras is applied.

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