

Tensor product decomposition up to superdimension zero

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Here is a simple question: Given two irreducible finite-dimensional representations of the general linear supergroup $GL(m|n)$, how does their tensor product decompose into indecomposable representations? The answer is unknown except for the case when both irreducible representations are so-called Kostant modules (which includes all irreducible representations of $GL(m|1)$ and all irreducible projective representations).

I will explain in this talk how to obtain the decomposition up to superdimension zero in the $GL(n|n)$ -case: Given two irreducible representations of non-vanishing superdimension, the indecomposable representations of non-vanishing superdimension in the tensor product decomposition can be found by the Littlewood-Richardson rule or its variants for the simple algebraic groups of type ABCD.

The approach is rather abstract: The quotient of $\text{Rep}(GL(n|n))$ by its largest proper tensor ideal (the negligible morphisms) is the representation category of a pro-reductive supergroup scheme. I will show some results about this supergroup scheme and explain what this implies about tensor product decompositions.