

Exact Morphism category and Gorenstein-projective representations

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Abstract. Let Q be a finite acyclic quiver, J be an ideal of kQ generated by all arrows in Q , A be a finite-dimensional k -algebra. The category of all finite-dimensional representations of (Q, J^2) over A is denoted by $\text{rep}(Q, J^2, A)$. In this paper, we introduced the category $\text{exa}(Q, J^2, A)$ which is a subcategory of $\text{rep}(Q, J^2, A)$ of all exact representations. The main result of this paper explicitly describes the Gorenstein-projective representations in $\text{rep}(Q, J^2, A)$, via the exact representations plus an extra condition. As a corollary, A is a self-injective algebra, if and only if the Gorenstein-projective representations are exactly the exact representations of (Q, J^2) over A .