UNIVERSAL DEFORMATION RINGS OF MODULES OVER A CERTAIN SYMMETRIC SPECIAL BISERIAL ALGEBRA

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ABSTRACT. Let $\Bbbk$ be an algebraically closed field, let Λ be a finite dimensional $\Bbbk$-algebra and let V a Λ-module with stable endomorphism ring isomorphic to $\Bbbk$. If Λ is self-injective V has a universal deformation ring $R(\Lambda, V)$, which is a complete local commutative Noetherian $\Bbbk$-algebra with residue field $\Bbbk$. Moreover, if Λ is also a Frobenius $\Bbbk$-algebra then $R(\Lambda, V)$ is stable under syzygies. We use these facts to determine the universal deformation rings of $\Lambda(s, t, u, k)$-modules with stable endomorphism ring isomorphic to $\Bbbk$, where $\Lambda(s, t, u, k)$ is a symmetric special biserial $\Bbbk$-algebra that has quiver with relations depending on the four parameters $s, t, u \geq 3$ and $k \geq 2$. Our goal is to explain how universal deformation rings change when inflating modules from $\Lambda(s, t, u, k)$ to $\Lambda(s', t', u', k')$, where $\Lambda(s', t', u', k')$ surjects onto $\Lambda(s, t, u, k)$ when $s' \geq s$, $t' \geq t$, $u' \geq u$, $k' \geq k$.

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