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Affine equivalence and Gorensteinness. (English) Zbl 1095.13027

Math. Scand. 95, No. 1, 5-22 (2004).

Let (R, \mathfrak{m}) be a commutative noetherian local ring. Let X be an object in $D(R)$, the derived category of R . One can consider the adjoint pair of covariant functors $X \otimes_R^L -$ and $\mathrm{RHom}_R(X, -)$, and the contravariant functor $\mathrm{RHom}_R(-, X)$. The contravariant functor $\mathrm{RHom}_R(-, X)$ is studied for the special cases $X = D$ the dualizing complex for R , $X = E(R/\mathfrak{m})$ the injective envelope of R/\mathfrak{m} , $X = \mathrm{R}\Gamma_{\mathfrak{a}}(D)$ the right derived section functor $\mathrm{R}\Gamma_{\mathfrak{a}}$ with respect to the ideal \mathfrak{a} in R , and $X = R$ [see *R. Hartshorne*, Invent. Math. 9, 145–164 (1970; Zbl 0196.24301); Lect. Notes Math. 20 (1966; Zbl 0212.26101); *E. Matlis*, Pac. J. Math. 8, 511–528 (1958; Zbl 0084.26601); *S. Yassemi*, Math. Scand. 77, No. 2, 161–174 (1995; Zbl 0864.13010)].

On the other hand the covariant functors $X \otimes_R^L -$ and $\mathrm{RHom}_R(X, -)$ are studied for the special cases $X = D$, $X = E(R/\mathfrak{m})$, and $X = \mathrm{RHom}(-, \mathrm{R}\Gamma_{\mathfrak{a}}(R))$ [see *L. L. Avramov* and *H.-B. Foxby*, Proc. Lond. Math. Soc., III. Ser. 75, No. 2, 241–270 (1997; Zbl 0901.13011), *W. G. Dwyer* and *J. P. C. Greenlees*, Am. J. Math. 124, No. 1, 199–220 (2002; Zbl 1017.18008), *A. Frankild* and *P. Jørgensen*, J. Pure Appl. Algebra 174, No. 2, 135–147 (2002; Zbl 1010.16009)]. In this paper the authors study the contravariant functor $\mathrm{RHom}(-, \mathrm{R}\Gamma_{\mathfrak{a}}(R))$ and the covariant functor $\mathrm{R}\Gamma_{\mathfrak{a}}(D) \otimes_R^L -$ and $\mathrm{RHom}_R(\mathrm{R}\Gamma_{\mathfrak{a}}(D), -)$.

Reviewer: [Siamak Yassemi \(Tehran\)](#)

MSC:

13H10 Special types (Cohen-Macaulay, Gorenstein, Buchsbaum, etc.)

13D25 Complexes (MSC2000)

Keywords:

Gorenstein ring; derived category; dualizing complex

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