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Lars Winther Christensen* (winther@math.unl.edu), Department of Mathematics, University of Nebraska-Lincoln, 203 Avery Hall, Lincoln, NE 68588-0130, and **Oana Veliche** (oveliche@math.utah.edu), Department of Mathematics, University of Utah, 155 S 1400 E, Salt Lake City, UT 84112/0090. *Acyclicity of complexes detects Gorensteinness of rings.*

Let R be a commutative noetherian ring. A complex of injective R -modules is said to be *acyclic* if it has zero homology, and it is called *totally acyclic* if the acyclicity is preserved by $\text{Hom}_R(I, -)$ for every injective R -module I .

Suppose R has a dualizing complex. Recent work of Iyengar and Krause shows that the difference between the category of acyclic complexes (of injective modules) and its subcategory of totally acyclic complexes measures how far R is from being Gorenstein. In particular, R is Gorenstein if and only if every acyclic complex (of injective modules) is totally acyclic.

The talk focuses on the construction of a specific acyclic complex with the property that it is totally acyclic if and only if R is Gorenstein. Test complexes of projective modules and of flat modules will also be discussed. (Received August 12, 2006)