

Vanishing of Tate homology and depth formulas over local rings

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Auslander's depth formula for pairs of Tor-independent modules over a regular local ring, $\text{depth}(M \otimes N) = \text{depth}(M) + \text{depth}(N) - \text{depth}(R)$, has been generalized in several directions over a span of four decades. In this paper we establish a depth formula that holds for every pair of Tate Tor-independent modules over a Gorenstein local ring. It subsumes previous generalizations of Auslander's formula and yields exact bounds for vanishing of cohomology over certain Gorenstein rings.

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