

DEPTH FORMULA AND VANISHING OF TATE HOMOLOGY

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For finitely generated modules M and N over a Gorenstein local ring R , one has

$$\text{depth } M + \text{depth } N = \text{depth}(M \otimes_R N) + \text{depth } R,$$

i.e., the depth formula holds, if the pair (M, N) is Tor-independent and Tate homology $\widehat{\text{Tor}}_i(M, N)$ vanishes for all $i \in \mathbb{Z}$. We establish the same conclusion under weaker hypotheses.

This is based on a joint work with Olgur Celikbas and Li Liang.