

## VANISHING RESULTS FOR THE COHOMOLOGY OF COMPLEX TORIC HYPERPLANE COMPLEMENTS

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**Abstract:** Suppose  $\mathcal{R}$  is the complement of an essential arrangement of toric hyperplanes in the complex torus  $(\mathbb{C}^*)^n$  and  $\pi = \pi_1(\mathcal{R})$ . We show that  $H^*(\mathcal{R}; A)$  vanishes except in the top degree  $n$  when  $A$  is one of the following systems of local coefficients: (a) a system of nonresonant coefficients in a complex line bundle, (b) the von Neumann algebra  $\mathcal{N}\pi$ , or (c) the group ring  $\mathbb{Z}\pi$ . In case (a) the dimension of  $H^n$  is  $|e(\mathcal{R})|$  where  $e(\mathcal{R})$  denotes the Euler characteristic, and in case (b) the  $n^{\text{th}}$   $\ell^2$  Betti number is also  $|e(\mathcal{R})|$ .

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