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Steenrod's cohomology realization problem for some monomial ideal rings

If A^* is a graded algebra a classical problem in Algebraic Topology asks if there exists a space Z , such that $H^*(Z) \cong A^*$. We investigate this realisation problem for monomial quotient rings A^* of the form $\mathbb{Z}[x_1, \dots, x_m] \otimes_{\mathbb{Z}} \Lambda_{\mathbb{Z}}[y_1, \dots, y_n]$ modulo an ideal generated by monic monomials. We interpret such rings as generalised Stanley–Reisner rings associated to multicomplexes. Within this framework we show that if the even generators of A^* have at most degree 4 then A^* is realizable as the cohomology ring of a homotopy colimit of products of $\mathbb{C}P^i$, $\mathbb{H}P^j$ $0 \leq i, j \leq \infty$ and S^{2k-1} ($k \in \mathbb{N}$) indexed by a sub-poset of the multicomplex.