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Koszul Cycles and Golod Rings

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Let S be the power series ring or the polynomial ring over a field K in the variables x_1, \dots, x_n , and let $R = S/I$, where I is proper ideal which we assume to be graded if S is the polynomial ring. We give an explicit description of the cycles of the Koszul complex whose homology classes generate the Koszul homology of $R = S/I$ with respect to x_1, \dots, x_n . The description is given in terms of the data of the free S -resolution of R . The result is used to determine classes of Golod ideals, among them proper ordinary powers and proper symbolic powers of monomial ideals.

This talk is based on a joint work with Jürgen Herzog.