Abstract

Polarization is a technique to deform an arbitrary monomial ideal I in a polynomial ring S into a squarefree monomial ideal $I^{\mathfrak{P}}$ in a larger polynomial ring $S^{\mathfrak{P}}$ such that S/I is a quotient of $S^{\mathfrak{P}}/I^{\mathfrak{P}}$ modulo a regular sequence of linear forms. We show that any cycles whose homology classes form a basis of the Koszul homology of I can be lifted to cycles representing a basis for the Koszul homology of $I^{\mathfrak{P}}$.

Next we consider the depth function for a graded ideal I in a polynomial ring S. By using the result of polarization of Koszul cycles on the quotient ring S/I, we find the values of depth function of whisker graphs of trees.