

**Meeting:** 1001, Evanston, Illinois, SS 9A, Special Session on Solving Polynomial Systems

1001-14-57            **Amit Khetan\*** ([khetan@math.umass.edu](mailto:khetan@math.umass.edu)), 615 Main Street Apt. 30, Amherst, MA 01002.

*Resultants of Sparse Polynomials and Toric Vanishing Theorems.*

The resultant of  $n + 1$  polynomials in  $n$  variables is the polynomial in the coefficients which vanishes when the given polynomials have a common root. When the polynomials are sparse with the same support this corresponds to computing Chow forms on toric varieties. The approach, dating back to Cayley, is to compute the determinant of certain complexes arising from Koszul complexes. In the case  $n = 3$  we show how to choose a complex of two terms whose determinant is exactly the resultant. This requires a new sheaf cohomology vanishing theorem on toric varieties which can be formulated in topological terms. We can also describe some supports in four or more variables for which determinantal formulas for the resultant exist. (Received July 28, 2004)