1001-55-171 **Daniel C Isaksen*** (`isaksen@math.wayne.edu`), Department of Mathematics, Wayne State University, Detroit, MI 48202, and **Daniel Dugger**. *Algebraic K-theory and sums-of-squares formulas.*

A sums-of-squares formula over a field F is a polynomial identity of the form

$$(x_1^2 + \cdots + x_r^2)(y_1^2 + \cdots + y_s^2) = z_1^2 + \cdots + z_n^2,$$

where each z_i is bilinear in the x's and y's over F. A classical theorem uses topological K-theory to prove that if such a formula exists over $\mathbb{R}$, then certain powers of 2 must divide certain binomial coefficients. While it has been known that this result works over all characteristic 0 fields, the characteristic p case has remained open. We prove the result for all fields, using algebraic K-theory in place of topological K-theory. (Received August 24, 2004)