

1023-14-1560 **Frank Sottile*** (sottile@math.tamu.edu) and **Frederic Bihan**. *Optimal fewnomial bounds from Gale dual polynomial systems.*

In 1980, Askold Khovanskii established his fewnomial bound for the number of real solutions to a system of polynomials, showing that the complexity of real solutions to a polynomial system depends upon the number of monomials and not the degree. This fundamental finiteness result in real algebraic geometry is believed to be unrealistically large.

I will report on joint work with Frederic Bihan on a new fewnomial bound which is substantially lower than Khovanskii's bound and asymptotically optimal. This bound is obtained by first reducing a given system to a Gale system, and then bounding the number of solutions to a Gale system. Like Khovanskii's bound, this bound is the product of an exponential function and a polynomial in the dimension, with the exponents in both terms depending upon the number of monomials. In our bound, the exponents are smaller than in Khovanskii's. (Received September 26, 2006)