1047-12-331 **Salma Kuhlmann*** (skuhlman@math.usask.ca), Center for Algebra, Logic and Computation, Department of Maths & Stats, McLean Hall, 106 Wiggins Road, Saskatoon, SK S7N 5E6, Canada, and **J. Cimpric** and **M. Marshall**. *Positivity in power series rings.*

Let $A = \mathbb{R}[x] := \mathbb{R}[x_1, \cdots, x_n]$ be the ring of polynomials in n variables with real coefficients. A preordering of A is a subset which contains all f^2 for $f \in A$, and is closed under addition and multiplication. For a finite subset $S = \{g_1, \cdots, g_s\}$ of A, we write $T = T_S$ for the preordering of A finitely generated by S, and $K = K_S$ for the set of all $x \in \mathbb{R}^n$ satisfying $g_i(x) \geq 0$ for $i = 1, \cdots, s$ (the basic closed semialgebraic set defined by S). We write Psd(K) for the set of all polynomials that are nonnegative on K. The preordering T is said to be saturated if T = Psd(K). Finitely generated saturated preorderings are particularly interesting since in this case, every nonnegative polynomial on the semialgebraic set has a concrete representation using sums of squares and the defining polynomials $\{g_1, \cdots, g_s\}$. In this talk we investigate what geometric properties of S imply that T is saturated. We know that T is never saturated if dim(K)$\geq$ 3. The case dim(K)$\leq$ 1 is well understood. We focus here on the 2- dimensional compact case. (Received February 01, 2009)