1086-47-1129 **Anatolii Grinshpan**, **Dmitry S Kaliuzhnyi-Verbovetskyi** and **Hugo J Woerdeman***
(`hugo@math.drexel.edu`), Department of Mathematics, Drexel University, 3141 Chestnut Street,
Philadelphia, PA 19104. *Norm-Constrained Determinantal Representations of Multivariable
Polynomials.*

For every multivariable polynomial p, with $p(0) = 1$, we construct a determinantal representation, $p = \det(I - KZ)$, where Z is a diagonal matrix with coordinate variables on the diagonal and K is a complex square matrix. Such a representation is equivalent to the existence of K whose principal minors satisfy certain linear relations. When norm constraints on K are imposed, we give connections to the multivariable von Neumann inequality, Agler denominators, and stability. We show that if a multivariable polynomial q, $q(0) = 0$, satisfies the von Neumann inequality, then $1 - q$ admits a determinantal representation with K a contraction. On the other hand, every determinantal representation with a contractive K gives rise to a rational inner function in the Schur–Agler class. (Received September 19, 2012)