

1135-47-2592 **scott mccullough*** (sam@ufl.edu). *Partial Matrix Convexity*. Preliminary report.

Let (s, x) denote a $g + h$ tuple of freely non-commuting variables with g x -variables and h s -variables. A polynomial $p = p(x, s)$, or more generally a matrix of polynomials, in (s, x) is a free polynomial. A free polynomial $p(s, x)$ is naturally evaluated on a $g + h$ tuple (S, X) of symmetric matrices of the same size and p is symmetric if the $p(S, X)$ is a symmetric matrix for all such (S, X) . This talk will focus on partial convexity conditions on p and of the set $D_p = \{(S, X) : I \succ p(S, X)\}$. This ongoing work is joint with a number of coauthors, including Sriram Balasubramanian, Harry Dym, Adrian Lim, Damon Hay, Bill Helton, Michael Jury, Igor Klep, and James Pascoe. (Received September 26, 2017)