1162-32-38 **Jennifer Brooks** and **Kevin Palencia***, 98 E Meadow Dr, Cortland, IL 60112. *A Rank Question for Homogeneous Polynomials.*

The Ebenfelt sum of squares conjecture and the degree estimate conjecture for proper rational mappings between balls in complex Euclidean spaces are open problems in several complex variables that naturally lead to the study of the rank of the bihomogeneous polynomial $r(z,\bar{z})\|z\|^2$ on $\mathbb{C}^{n+1}$ under certain additional hypotheses. When r has a diagonal coefficient matrix, these questions reduce to questions about the rank of the real polynomial $P = SQ$, where Q is a homogeneous polynomial and $S(x) = \sum_{j=0}^{n} x_j$. In this talk, we describe joint work with Jennifer Brooks that uses techniques from commutative algebra to estimate the minimum rank of $P = SQ$ under the additional hypothesis that Q has maximum rank. The problem has already been solved for $n+1 \leq 3$, and so we consider $n+1 \geq 4$. We obtain a minimum rank estimate that is sharp when $n+1 = 4$, and we exhibit a family of polynomials having this minimum rank. We exhibit an estimate for $n+1 > 4$ that is not sharp, but is nonetheless nontrivial. (Received August 17, 2020)