1171-13-95 Patricia Klein* (klein847@umn.edu) and Anna Weigandt (weigandt@mit.edu). Bumpless pipe dreams encode Gröbner geometry of Schubert polynomials.

Knutson and Miller established a connection between the anti-diagonal Gröbner degenerations of matrix Schubert varieties and the pre-existing combinatorics of pipe dreams. They used this correspondence to give a geometrically-natural explanation for the appearance of the combinatorially-defined Schubert polynomials as representatives of Schubert classes. Recently, Hamaker, Pechenik, and Weigandt conjectured a similar connection between diagonal degenerations of matrix Schubert varieties and bumpless pipe dreams, newer combinatorial objects introduced by Lam, Lee, and Shimozono.

We prove this conjecture in full generality. The proof provides tools for assessing the Cohen–Macaulayness of equidimensional unions of matrix Schubert varieties, of which alternating sign matrix varieties are an important example. This talk will include sufficient geometric and combinatorial background to situation the our main result as well as a description of open problems in homological commutative algebra motivated by this geometry and combinatorics. (Received August 08, 2021)