

1146-14-260

Jonathan D Hauenstein, **Anton Leykin** and **Jose I Rodriguez** (sottile@math.tamu.edu), mailstop 3368, College Station, TX 77843-3368, and **Frank Sottile***, Department of Mathematics, mailstop 3368, mailstop 3368, College Station, TX 77843-3368. *Numerical irreducible decomposition for multiprojective varieties*. Preliminary report.

A common structure of algebraic equations and varieties from the applications of mathematics is multihomogeneity, so that the resulting varieties are subvarieties of products of projective spaces, called multiprojective varieties. Hauenstein and Rodriguez introduced a version of witness sets (witness collections) for these and an algorithm for their numerical irreducible decomposition. This was refined to an optimal algorithm when there are two factors by Leykin, Rodriguez, and the speaker. A bottleneck is finding a version of the trace test that does not suffer from combinatorial explosion.

In this talk, I will describe this background and subsequent work of we four that uses dimension reductions and merging based on Bertini's Theorem. This gives a minimal version of multiprojective witness collections, matroidal witness sets, as well as an optimal algorithm for numerical irreducible decomposition of such varieties whose trace test avoids combinatorial explosion. (Received January 24, 2019)