Jonathan D. Hauenstein* (hauenstein@nd.edu), 152C Hurley Hall, Notre Dame, IN 46556, and Daniel A. Brake and Alan C. Liddell. Decomposition of solution sets via derivatives.

A core computation in numerical algebraic geometry is the decomposition of the solution set of a system of polynomial equations into irreducible components, called the numerical irreducible decomposition. One approach to validate a decomposition is what has come to be known as the “trace test.” This test, described by Sommese, Verschelde, and Wampler in 2002, relies upon path tracking and hence could be called the “tracking trace test.” We present a new approach which replaces path tracking with local computations involving derivatives, called a ”local trace test.” We conclude by demonstrating this local approach with examples from kinematics and tensor decomposition. (Received August 08, 2016)