Geometry of Polynomial System Solving, Optimization and Topology



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Abstract. We develop a new method that improves the efficiency of equation-by-equation homotopy continuation methods for solving polynomial systems. Our method is based on a novel geometric construction and reduces the total number of homotopy paths that must be numerically continued. These improvements may be applied to the basic algorithms of numerical algebraic geometry in the settings of both projective and multiprojective varieties. (This is joint work with T. Duff and J. I. Rodriguez.)