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Anton Leykin, Jan Verschelde and Ailing Zhao* (azhao1@uic.edu), Department of MSCS, University of Illinois at Chicago, M/C 249, 851 S. Morgan Street, Chicago, IL 60607. *Application of Newton's method with Deflation.*

We propose a modification of Newton's method. By deflation we restore the quadratic convergence of Newton's method for isolated singular solutions of polynomial systems. Our method is symbolic-numeric: we produce a new polynomial system which has the original multiple solution as a regular root. The number of deflation stages is bounded by the multiplicity of the isolated root. At ISSAC'05, Dayton and Zeng gave tighter bounds on the number of deflations by a duality analysis.

This talk will give an overview of our deflation method, with an emphasis on its efficient implementation and applications. (Received February 13, 2006)