1023-65-849   **Anton Leykin**, **Jan Verschelde** and **Ailing Zhao*** (`azhao1@uic.edu`), University of Illinois at Chicago, Departmen of Math, Stat, and CS (M/C 249), 851 S. Morgan Street, Chicago, IL 60607-7045. *Newton's method with deflation for isolated singularities of polynomial systems.*

We present a modification of Newton's method to restore quadratic convergence 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. We show that the number of deflation stages is bounded by the multiplicity of the isolated root. Our implementation performs well on a large class of applications.