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**Anton Leykin\***, leykin@ima.umn.edu, and **Jan Verschelde** and **Ailing Zhao**. *Numerical deflation of multiple solution components of systems of polynomial equations.*

Our work on *deflation* belongs to the area of the *numerical algebraic geometry* that deals with solving systems of polynomial equations over the complex numbers. The methods developed in this field encounter serious obstacles when the algebraic variety corresponding to the ideal generated by the equations contains components that enter its irreducible decomposition with multiplicity larger than 1.

Deflation “regularizes” the system at the isolated multiple solution by constructing an augmented system in a higher-dimensional ambient space that has an isolated solution of multiplicity 1 projecting on the original multiple solution.

Since the positive-dimensional case reduces to the zero-dimensional one, the deflation procedure restores the stability of the underlying numerical algorithms both for isolated singular solutions and when treating positive-dimensional components. (Received September 21, 2006)