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**Anton Leykin\*** ([leykin@math.uic.edu](mailto:leykin@math.uic.edu)). *Numerical primary decomposition.*

Consider a complex affine variety  $X \subset \mathbb{C}^n$  defined by an ideal  $I$  in the corresponding coordinate ring. The main construction we employ is that of the *deflated variety*  $X^{(d)}$  in a complex space of higher dimension with a natural projection onto  $X$ . For an embedded component  $Y \subset X$  we show that there exists  $d$  such that there is an isolated component  $Z \subset X^{(d)}$  projecting onto  $Y$ .

This leads to a new decomposition algorithm. In particular, if *numerical primary decomposition* is used for finding isolated components of a deflated variety, then all components of  $I$  can be described with numerical data. We call such description a *numerical primary decomposition* (NPD); Some tasks accomplished traditionally with Gröbner bases can be approached with the NPD, e.g., the ideal membership problem. (Received July 28, 2008)