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Lee Tsung-Lin* (leetsung@msu.edu), Department of Mathematics, Michigan State University, East Lansing, MI 48824, **Li Tien-Yien**, Department of Mathematics, Michigan State University, East Lansing, MI 48824, and **Zeng Zhonggang**, Department of Mathematics, Northeastern Illinois University, Chicago, IL 60625. *A rank-revealing method for low rank matrices with updating, downdating, and applications.*

Rank-revealing has a wide range of applications in scientific computing such as numerical polynomial algebra, signal processing and information retrieval. Although singular value decomposition is the standard rank-revealing method, it is costly in both computing time and storage when the ranks or the nullities are low for large matrices, and it is inefficient in updating and downdating when rows and columns are inserted or deleted. Following up on a recent rank-revealing algorithm by T.Y. Li and Z. Zeng in the low nullity case, we propose a new rank-revealing algorithm for low rank matrices with efficient and reliable updating/downdating capabilities. A comprehensive computing result shows the new method is accurate, robust, and substantially faster than the existing rank-revealing algorithms. Applications in image processing and information retrieval will be presented in this talk. (Received July 27, 2007)