

1108-65-411

**Liping Chen** ([chenlipi@msu.edu](mailto:chenlipi@msu.edu)), 619 Red Cedar Road, East Lansing, MI 48824, **Lixing Han\*** ([lxhan@umflint.edu](mailto:lxhan@umflint.edu)), 303 East Kearsley Street, Flint, MI 48502, and **Liangmin Zhou** ([zhoulia@msu.edu](mailto:zhoulia@msu.edu)), 619 Red Cedar Road, East Lansing, MI 48824. *Computing Eigenvalues and Eigenvectors of Tensors via Homotopy Continuation.*

Eigenvalues and eigenvectors of tensors have found applications in automatic control, data analysis, higher order diffusion tensor imaging, image authenticity verification, optimization, and other areas. Recently, several algorithms have been proposed for computing certain eigenpairs of symmetric tensors or nonnegative tensors. However, there is a lack of efficient methods that can compute all eigenpairs of general tensors. In this talk, we will describe a method that is based on HOM4PS (an implementation of the homotopy method) and deflation method for computing tensor eigenpairs. If implemented properly, this method can efficiently find all isolated eigenpairs of a tensor and some eigenpairs contained in the positive dimensional components. We will also describe methods for computing real eigenpairs based on the found complex eigenpairs. We wish to thank Professor T.Y. Li for his encouragement and support. (Received January 19, 2015)