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Fei Xue* (fxue@clemson.edu), Department of Mathematical Sciences, Martin Hall O-203, Clemson University, Clemson, SC 29634, and **Minghao Wu** (mwrostan@syr.edu), Department of Mathematics, 215 Carnegie Building, Syracuse University, Syracuse, NY 13244. *Fast and robust computation of right-most eigenvalues of large matrices*. Preliminary report.

We propose a matrix exponential transformation for computing the right-most eigenvalues of a large matrix A or a matrix pencil (A, B) . Robust numerical algorithms for computing these eigenvalues are needed for linear stability analysis of dynamic systems and hence have important applications. Since exponential maps the right-most eigenvalues of A to dominant eigenvalues of $\exp(A)$ that are easily captured by eigenvalue algorithms, the most important technique for the success of this approach is fast and robust computation of the exponential matrix vector product $\exp(hA)v$. We discuss polynomial and rational approximations to this matrix vector product using Leja interpolation points. Numerical results demonstrate the effectiveness of the proposed algorithms. (Received September 20, 2016)