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**Lyapunov inverse iteration for computing a few rightmost
eigenvalues of large generalized eigenvalue problems**

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In linear stability analysis of a large-scale dynamical system, we need to compute the rightmost eigenvalue(s) for a series of large generalized eigenvalue problems. Existing iterative eigenvalue solvers are not robust when no estimate of the rightmost eigenvalue(s) is available. In this study, we show that such an estimate can be obtained from Lyapunov inverse iteration applied to a special eigenvalue problem of Lyapunov structure. Furthermore, we generalize the analysis to a deflated version of this problem, and propose an algorithm that computes a few rightmost eigenvalues for the eigenvalue problems arising from linear stability analysis. Numerical experiments demonstrate the robustness of the algorithm.