ON THE COMPUTATION OF USEFUL QUANTITIES IN GRAPHS WITH ABSORPTION

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Let $G$ be a graph with a notion of absorption on its nodes. Such graphs play an important role in applications such as the modeling of epidemics spreading. The absorption inverse is a generalized inverse of the graph Laplacian and it provides a wealth of information on the structure of the underlying graph. In this work we describe and compare different algorithms for the efficient computation of the absorption inverse and related quantities, which are based on the LU factorization, the reduced row echelon form (rref) evaluation and on iterative methods tested using various preconditioners. These algorithms are implemented in MATLAB environment employing MATLAB and LAPACK functions. Furthermore, we discuss and compare the centrality measures for ranking the nodes of graphs with absorption that the absorption inverse can provide.

References
