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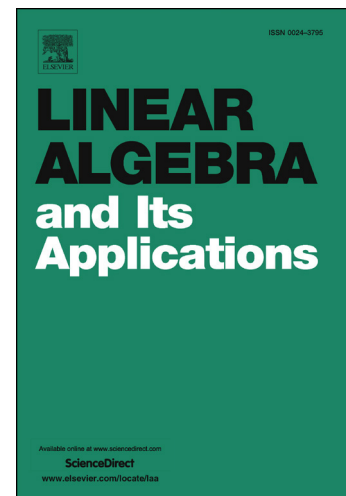
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The effect on eigenvalues of connected graphs by adding edges*

Ji-Ming Guo^{a†}, Pan-Pan Tong^a, Jianxi Li^b,
Wai Chee Shiu^c, Zhi-Wen Wang^a

^aDepartment of Mathematics,
East China University of Science and Technology, Shanghai, P.R. China

^bDepartment of Mathematics & Information Science,
Minnan Normal University, Zhangzhou, Fujian, P.R. China

^cDepartment of Mathematics,
Hong Kong Baptist University, Kowloon Tong, Hong Kong, P.R. China.

Abstract

By the well-known Perron-Frobenius Theorem [3], for a connected graph G , its largest eigenvalue strictly increases when an edge is added. We are interested in how the other eigenvalues of a connected graph change when edges are added. Examples show that all cases are possible: increased, decreased, unchanged. In this paper, we consider the effect on the eigenvalues by suitably adding edges in particular families, say the family of connected graphs with clusters. By using the result, we also consider the effect on the energy by suitably adding edges to the graphs of the above families.

AMS classification: 05C50

Keywords: graph; eigenvalue; adding an edge; energy

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[†]Corresponding author; Email addresses: jimingguo@hotmail.com(J.-M. Guo), ptjxli@hotmail.com(J. Li), wcshiu@hkbu.edu.hk(W.C. Shiu), 798843879@qq.com(Z.-W. Wang)

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