

Accepted Manuscript

The change in multiplicity of an eigenvalue due to adding or removing edges

Charles R. Johnson, Carlos M. Saiago, Kenji Toyonaga

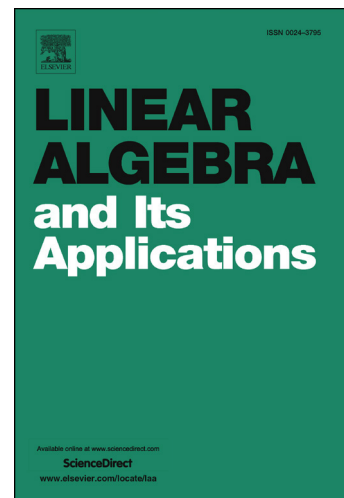
PII: S0024-3795(18)30458-0
DOI: <https://doi.org/10.1016/j.laa.2018.09.017>
Reference: LAA 14732

To appear in: *Linear Algebra and its Applications*

Received date: 30 July 2016
Accepted date: 19 September 2018

Please cite this article in press as: C.R. Johnson et al., The change in multiplicity of an eigenvalue due to adding or removing edges, *Linear Algebra Appl.* (2018), <https://doi.org/10.1016/j.laa.2018.09.017>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



The change in multiplicity of an eigenvalue due to adding or removing edges

Charles R. Johnson*, Carlos M. Saiago[†], and Kenji Toyonaga[‡]

September 21, 2018

Abstract

We investigate the change in the multiplicities of the eigenvalues of a Hermitian matrix with a simple graph G , when edges are inserted into G or removed from G . We focus upon cases in which the multiplicity of the eigenvalue does not change due to inserting or removing edges incident to a vertex. Furthermore, we show how the change in the multiplicities of the eigenvalues occur, when two disjoint graphs are connected with one edge, based upon the status of the vertices that are connected. Lastly, we give the possible classifications of cut-edges in a graph and characterize the occurrence of each possible status.

Key words. Cut-edge, Edge, Eigenvalues, Graph, Hermitian matrix, Multiplicity

AMS subject classifications. 15A18, 05C50, 15B57, 13H15

*Department of Mathematics, College of William and Mary, P.O. Box 8795, Williamsburg, VA 23187-8795, USA (crjohn@wm.edu).

[†]Centro de Matemática e Aplicações (CMA/FCT/UNL), Departamento de Matemática, Faculdade de Ciências e Tecnologia da Universidade NOVA de Lisboa, 2829-516 Quinta da Torre, Portugal (cls@fct.unl.pt). This work was carried out within the activities of CMA/FCT/UNL and it was partially supported by Fundação para a Ciência e a Tecnologia through the project UID/MAT/00297/2013 (Centro de Matemática e Aplicações).

[‡]Corresponding author. Department of Creative Engineering, National Institute of Technology, Kitakyushu College, Kokuraminami-ku, Kitakyushu, 802-0985, Japan (toyonaga@kct.ac.jp).

Download English Version:

<https://daneshyari.com/en/article/11024728>

Download Persian Version:

<https://daneshyari.com/article/11024728>

[Daneshyari.com](https://daneshyari.com)