Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 17, pp. 54-61, February 2008

ELA
http://math.technion.ac.il/iic/ela

A NOTE ON THE LARGEST EIGENVALUE OF NON-REGULAR GRAPHS*

BOLIAN LIU† AND GANG LI†

Abstract. The spectral radius of connected non-regular graphs is considered. Let λ_1 be the largest eigenvalue of the adjacency matrix of a graph G on n vertices with maximum degree Δ. By studying the λ_1-extremal graphs, it is proved that if G is non-regular and connected, then $\Delta - \lambda_1 > \dfrac{\Delta + 1}{n(3n + \Delta - 8)}$. This improves the recent results by B.L. Liu et al.

AMS subject classifications. 05C50, 15A48.

Key words. Spectral radius, Non-regular graph, λ_1-extremal graph, Maximum degree.

*Received by the editors November 21, 2007. Accepted for publication February 15, 2008. Handling Editor: Stephen J. Kirkland.

†School of Mathematics Sciences, South China Normal University, Guangzhou, 510631, P.R. China (liubl@scnu.edu.cn, tepal.li@sohu.com). This work was supported by the National Natural Science Foundation of China (No.10771080) and by DF of the Ministry of Education of China (No.20070574006).