Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 18, pp. 735-744, November 2009

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

ON λ_1-EXTREMAL NON-REGULAR GRAPHS*

BOLIAN LIU†, YUFEI HUANG†, AND ZHIFU YOU†

Abstract. Let G be a connected non-regular graph with n vertices, maximum degree Δ and minimum degree δ, and let λ_1 be the greatest eigenvalue of the adjacency matrix of G. In this paper, by studying the Perron vector of G, it is shown that type-I-a graphs and type-I-b (resp. type-II-a) graphs with some specified properties are not λ_1-extremal graphs. Moreover, for each connected non-regular graph some lower bounds on the difference between Δ and λ_1 are obtained.

Key words. Spectral radius, Non-regular graph, λ_1-extremal graph, Perron vector, Degree.

AMS subject classifications. 05C50, 15A48.

*Received by the editors March 30, 2009. Accepted for publication November 11, 2009. Handling Editor : Bryan L. Shader.

†School of Mathematical Science, South China Normal University, Guangzhou, 510631, P.R. China (liubl@scnu.edu.cn, fayger@qq.com, youzhf@hotmail.com). The first author is supported by NSF of China (NO.10771080) and SRFDP of China (NO.20070574006).