

A LOWER BOUND FOR THE NUMBER OF DISTINCT EIGENVALUES OF SOME REAL SYMMETRIC MATRICES*

C.M. DA FONSECA[†]

Abstract. This mostly expository note surveys and recovers a lower bound for the number of distinct eigenvalues of real symmetric matrices associated with a graph. The relation is established with the length of some paths of the underlying graph, using an improvement of an inequality involving the multiplicities of the eigenvalues. An interesting use of that number is observed. Some applications of the results to particular classes of graphs are considered.

Key words. Multiplicities, distinct eigenvalues, real symmetric matrices, graphs, paths, spectra.

AMS subject classifications. 05C50

*Received by the editors on June 10, 2009. Accepted for publication on July 31, 2010. Handling Editors: Roger A. Horn and Fuzhen Zhang.

[†]Department of Mathematics, University of Coimbra, 3001-454 Coimbra, Portugal (cmf@mat.uc.pt). This work was supported by CMUC - Centro de Matemática da Universidade de Coimbra.