THE EIGENVALUE DISTRIBUTION OF BLOCK DIAGONALLY
DOMINANT MATRICES AND BLOCK H−MATRICES∗

CHENG-YI ZHANG†, SHUANGHUA LUO‡, AIQUN HUANG§, AND JUNXIANG LU¶

Abstract. The paper studies the eigenvalue distribution of some special matrices, including block diagonally dominant matrices and block $H$−matrices. A well-known theorem of Taussky on the eigenvalue distribution is extended to such matrices. Conditions on a block matrix are also given so that it has certain numbers of eigenvalues with positive and negative real parts.

Key words. Eigenvalues, Block diagonally dominant, Block $H$−matrix, Non-Hermitian positive (negative) definite.

AMS subject classifications. 15A15, 15F10.

∗Received by the editors March 25, 2009. Accepted for publication July 31, 2010. Handling Editor: Joao Filipe Queiro.
†Department of Mathematics of School of Science, Xi'an Polytechnic University, Xi'an, Shaanxi 710048, P.R. China; Corresponding author (chengyizhang@yahoo.com.cn or zhangchengyi@163.com).
‡Department of Mathematics of School of Science, Xi'an Polytechnic University, Xi'an, Shaanxi 710048, P.R. China (iwantflyluo@163.com).
§Department of Mathematics of School of Science, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, P.R. China.
¶Department of Mathematics of School of Science, Xi'an Polytechnic University, Xi'an, Shaanxi 710048, P.R. China (jun-xianglu@163.com). The work of this author was Supported by Natural Science Basic Research Project in Shaanxi Province: 2010JQ1016.