

SOME CHARACTERIZATIONS OF TOTALLY NONPOSITIVE (TOTALLY NEGATIVE) MATRICES*

RAFAEL CANTÓ[†], BEATRIZ RICARTE[†], AND ANA M. URBANO[†]

Abstract. An $n \times m$ real matrix A is said to be totally nonpositive (totally negative) if every minor is nonpositive (negative). In this paper, we study characterizations of these classes of matrices by minors, by their full rank factorization and by their thin QR factorization.

Key words. Totally nonpositive and totally negative matrices, Full rank factorization, Thin QR factorization.

AMS subject classifications. 65F40, 15A15, 15A23.

*Received by the editors June 3, 2009. Accepted for publication April 19, 2010. Handling Editor: Joao Filipe Queiro.

[†]Institut de Matemàtica Multidisciplinar, Universidad Politècnica de Valencia, 46071 Valencia, Spain (rcanto@mat.upv.es, bearibe@mat.upv.es, amurbano@mat.upv.es). Supported by the Spanish DGI grant MTM2007-64477 and by the UPV under its research program.