Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 15, pp. 22-49, January 2006

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

BOUNDED AND STABLY BOUNDED PALINDROMIC DIFFERENCE EQUATIONS OF FIRST ORDER*

LEIBA RODMAN†

Abstract. Criteria for palindromic difference equations $A^\star x_i + Ax_{i+1} = 0$, where * stands for either transpose or conjugate transpose, to have bounded or stably bounded solutions are given in terms of the congruent equivalent classes of the matrix A. It is proved that the set of bounded palindromic difference equations is connected in the complex case, and has two connected components corresponding to the sign of the determinant of A in the real case. The connected components of the set of stably bounded palindromic difference equations are characterized.

Key words. Palindromic, Difference equations of first order, Bounded solutions, Stably bounded solutions, Matrix congruence, Canonical forms.

AMS subject classifications. 15A63, 39A99.

*Received by the editors 4 September 2005. Accepted for publication 18 January 2006. Handling Editor: Harm Bart.

†Department of Mathematics, College of William and Mary, Williamsburg, VA 23187-8795, USA (lxrodm@math.wm.edu). Research was supported in part by a Faculty Research Assignment of the College of William and Mary and by NSF grant DMS-0456625.