Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 11, pp. 103-114, April 2004

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

EIGENVALUE MULTIPLICITIES OF PRODUCTS OF COMPANION MATRICES*

ERIC S. KEY† AND HANS VOLKMER†

Abstract. It is shown that under suitable conditions an eigenvalue of a product of companion matrices has geometric multiplicity equal to one. The result is used to show that for a class of Random Walks in Periodic Environments recurrence is equivalent to a product of companion matrices having 1 as an eigenvalue of algebraic multiplicity greater than one.

Key words. Matrix products, Eigenvalue multiplicities, Companion matrices, Random walk in a periodic environment.

AMS subject classifications. 15A18, 15A21, 60J10.

*Received by the editors 9 June 2003. Accepted for publication 1 April 2004. Handling Editor: Stephen J. Kirkland.

†Department of Mathematical Sciences, University of Wisconsin-Milwaukee, PO Box 413, Milwaukee, Wisconsin 53201-0413, USA (ericskey@uwm.edu, volkmer@uwm.edu).