ON CONSTRUCTION OF A COMPLEX FINITE JACOBI MATRIX FROM TWO SPECTRA∗

GUSEIN SH. GUSEINOV†

Abstract. This paper concerns with the inverse spectral problem for two spectra of finite order complex Jacobi matrices (tri-diagonal symmetric matrices with complex entries). The problem is to reconstruct the matrix using two sets of eigenvalues, one for the original Jacobi matrix and one for the matrix obtained by replacing the last diagonal element of the Jacobi matrix by some other number. The uniqueness and existence results for solution of the inverse problem are established and an explicit procedure of reconstruction of the matrix from the two spectra is given.

Key words. Jacobi matrix, Difference equation, Eigenvalue, Normalizing numbers, Inverse spectral problem.

AMS subject classifications. 65F18.

∗Received by the editors on September 13, 2012. Accepted for publication on January 21, 2013. Handling Editor: Raphael Loewy.
†Department of Mathematics, Atılım University, 06836 Incek, Ankara, Turkey (guseinov@atilim.edu.tr).