Electronic Transactions on Numerical Analysis.
Volume 19, pp. 48-57, 2005.

ISSN 1068-9613.

ETNA
Kent State University
etna@mcs.kent.edu

SZEGŐ QUADRATURE AND FREQUENCY ANALYSIS*

LEYLA DARUIS†, OLAV NJÅSTAD‡, AND WALTER VAN ASSCHE§

Abstract. A series of papers have treated the frequency analysis problem by studying the zeros of orthogonal polynomials on the unit circle with respect to measures determined by observations of the signal. In the recent paper [3], a different approach was used, where properties of Szegő quadrature formulas associated with the zeros of para-orthogonal polynomials with respect to the same measures were used to determine the frequencies and amplitudes in the signal. In this paper we carry this approach further, and obtain more conclusive results.

Key words. Szegő polynomials, Szegő quadrature formula, frequency analysis problem.

AMS subject classifications. 41A55, 33C45.

---

*Received November 30, 2002. Accepted for publication May 10, 2003. Communicated by F. Marcellán and J. Arvesú.

†Department of Mathematical Analysis, La Laguna University, Tenerife, Canary Islands, Spain. E-mail: `ldaruis@ull.es`. The work of this author was supported partially by La Laguna University under contract 1802010204 and by Ministerio de Ciencia y Tecnología del Gobierno Español under contract BFM2001-3411.

‡Department of Mathematical Sciences, Norwegian University of Science and Technology, Trondheim, Norway. E-mail: `njastad@math.ntnu.no`.

§Department of Mathematics, Katholieke Universiteit Leuven, Belgium. The work of this author was supported by INTAS project 00-272 and by FWO research project G.0184.02. E-mail: `Walter@wis.kleuven.ac.be`.