

**Kovalyov, Ivan**

**Darboux transformation of generalized Jacobi matrices.** (English) Zbl 1324.47058  
Methods Funct. Anal. Topol. 20, No. 4, 301-320 (2014).

The author studies the so-called monic generalized Jacobi matrices, infinite block matrices  $J$  associated with systems of difference equations of the form

$$b_j y_{n_j-1}(\lambda) - p_j(\lambda) y_{n_j}(\lambda) + y_{n_j+1}(\lambda) = 0,$$

where  $\{n_j\}$  is a sequence connected with singularity levels of submatrices of the Hankel matrix defined by a sequence of moments,  $b_j \in \mathbb{R} \setminus \{0\}$ ,  $p_j(\lambda)$  are monic polynomials of degree  $l_j = n_{j+1} - n_j$ .

Such a study was carried out by *M. Derevyagin* and *V. Derkach* [Linear Algebra Appl. 435, No. 12, 3056–3084 (2011; [Zbl 1227.47018](#))] under an additional quasi-definiteness condition. In the paper under review, factorizations of  $J$  into the product of lower and upper triangular matrices are found, as well as analogs of the Darboux transformation and of the Christoffel formulas for polynomials of the first and second kind.

Reviewer: [Anatoly N. Kochubei \(Kyïv\)](#)

**MSC:**

- [47B36](#) Jacobi (tridiagonal) operators (matrices) and generalizations
- [47A57](#) Linear operator methods in interpolation, moment and extension problems
- [42C05](#) Orthogonal functions and polynomials, general theory of nontrigonometric harmonic analysis
- [44A60](#) Moment problems

Cited in **3** Documents

**Keywords:**

[generalized Jacobi matrices](#); [Darboux transformation](#); [Christoffel formulas](#)