

Discrete Analogs of Canonical Systems with Pseudo–Exponential Potential. Definitions and Formulas for the Spectral Matrix Functions

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We define and study the discrete analogue of canonical differential expressions. We focus on the rational case. Two kinds of discrete systems are to be distinguished: one–sided and two–sided. In both cases the analogue of the potential is a sequence of numbers in the open unit disk (Schur coefficients). We define the characteristic spectral functions of the discrete systems and provide exact realization formulas for them when the Schur coefficients are of a special form called strictly pseudo–exponential. Corresponding inverse problems will also be reviewed.