A general approach to spectral analysis of Schrödinger-type difference equations

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In this paper, a generalized Schrödinger type difference operator L is handled within the context of spectral investigation. Jost-type solutions are presented, discrete spectrum, continuous spectrum and the set of spectral singularities of the generalized operator L are determined, and their quantitative properties are examined. Therefore, acquired results for Sturm-Liouville type difference equations are extended to a generalized form, and spectral properties of Klein-Gordon type difference equations are analyzed in the special case. Finally, the principal vectors corresponding to eigenvalues and spectral singularities are introduced to lay a groundwork for the spectral expansion.

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