
Periodic GMP matrices

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Abstract

Let $E = [b_0, a_0] \setminus \bigcup_{j=1}^g (a_j, b_j)$ be a finite system of intervals. Not all sets of this kind are spectra of periodic Jacobi matrices. This is only the case if there exists a polynomial T such that $T^{-1}([-2, 2]) = E$. We define a new class of operators called GMP matrices such that for any finite system of intervals the isospectral torus, i.e.,

$$A(E) := \{A : A \text{ is reflectionless GMP matrix on its spectral set } E\},$$

consists of periodic GMP matrices. Their spectral theory and relation to Jacobi matrices will be discussed. To describe the latter one we introduce a discrete dynamical system on $A(E)$, which we call the Jacobi flow on GMP matrices.

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