

Time-and-band limiting for matrix valued orthogonal polynomials

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In this talk we try to give a survey of the current state of the problem of time-and band-limiting in connection with matrix valued orthogonal polynomials satisfying differential equations (i.e a bispectral situation).

For a given family of matrix orthogonal polynomials one considers the global operator defined by a full symmetric matrix or an integral operator, given by the truncated inner products. The problem is to search for a local operator given by a narrow band matrix or a differential operator (respectively), with simple spectrum, commuting with this operator. The existence of a commuting local operator is very useful to compute numerically the eigenfunctions of the given global operator.

This question is motivated by the work of Claude Shannon and a series of papers by D. Slepian, H. Landau and H. Pollak at Bell Labs in the 1960's.