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**Analysis and optimal control of time-varying linear systems via shifted Legendre polynomials.** (English) [Zbl 0562.93035](#)

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**Summary:** This paper extends the application of shifted Legendre polynomial expansion to time-varying systems. The extension is achieved through representing the product of two shifted Legendre series in a new shifted Legendre series. With this treatment of the product of two time functions, the operational properties of the shifted Legendre polynomials are fully applied to the analysis and optimal control of time-varying linear systems with quadratic performance index.

**MSC:**

- 93C05 Linear systems in control theory
- 42C10 Fourier series in special orthogonal functions (Legendre polynomials, Walsh functions, etc.)
- 93C99 Model systems in control theory
- 33C45 Orthogonal polynomials and functions of hypergeometric type (Jacobi, Laguerre, Hermite, Askey scheme, etc.)
- 44A45 Classical operational calculus
- 34K35 Control problems for functional-differential equations

Cited in **28** Documents

**Keywords:**

shifted Legendre polynomial expansion; time-varying systems; quadratic performance index

**Full Text:** [DOI](#)

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