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(54) Abstract Title: **Broadband transfer function synthesis using orthonormal rational bases**

(57) In order to generate a broadband transfer function of complex characteristics of a linear time-invariant (LTI) system, data characterising properties of the system are acquired. A set of poles in the complex plane are defined to characterise the system, and then an iterative process is performed to: define a set of orthonormal rational basis functions incorporating the defined poles, use the orthonormal rational basis functions to estimate transfer function coefficients, and derive revised values for the complex poles, until a desired level of accuracy of the transfer function coefficients is attained. The revised complex poles are used to determine parameters of the broadband transfer function. The revised poles can be derived by constructing a state-space representation and solving for eigenvalues.

Fig.2



