

A Survey on Linear Time Invariant Multivariable Positive Real Systems

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Abstract : Positive realness as the most important property of driving point impedance of passive electrical networks appears in the control systems stability theory in 1960's. There are three important subsets of positive real (PR) systems are introduced by researchers, that is, loss-less positive real (LLPR) systems, weakly strictly positive real (WSPR) systems and strictly positive real (SPR) systems. In this paper, definitions, properties, lemmas, and theorems related to family of positive real systems are summarized. Properties in both frequency domain and state space representation of system are explained. Also, several illustrative examples are presented.

Keywords : real rational matrix transfer functions, positive realness property, strictly positive realness property, Hermitian form asymptotic property, pole-zero properties

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