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Rational Function Approximation of a Fundamental Fractional Order Transfer Function

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Abstract : This paper introduces a rational function approximation of the fractional order transfer function . $H(s)=(\omega_0 s)^?/(1+(\omega_0 s)^{2?})$ This fractional order transfer function is one of the fundamental functions of the linear fractional system of commensurate order corresponding to pure complex conjugate poles or eigenvalues, in $s^?$. Hence, the proposed approximation will be used in the solution of the linear fractional systems of commensurate order. Illustrative examples are given to show the exactitude and the efficiency of the approximation method.

Keywords : Fractional power zero, linear fractional system, irrational transfer function, rational transfer function