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Analog Circuit Implementation of FractionalOrder Damped Sine and Cosine Functions

H. Nezzari, A. Charef, and D. Boucherma

Abstract: This paper introduces for thefirst time analog circuitimplementations of two fundamental linear fractional order systems whose impulse responses called fractional order damped sineand cosine functions are the inverse Laplace transform of their irrational transfer functions. These analog circuit implementations are derived through rational function approximations of their irrational transfer functions.

Keywords: Analog circuit, fractionalorder differential equation, fractional order system, irrational function, rational function.