

1135-VN-596

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*Rational Approximation of the Mittag-Leffler Functions with Real Distinct Poles.*

Mittag-Leffler functions are indispensable in the theory of fractional calculus and many other applications in engineering. However, their computational complexities have made them difficult to deal with numerically. A real distinct pole rational approximation of the two-parameter Mittag-Leffler function is proposed. Under some mild conditions, this approximation is proven and empirically shown to be L-Acceptable. These approximations are especially useful in developing efficient and accurate numerical schemes for partial differential equations of fractional order. Some applications are presented, such as complementary error function and solution of fractional differential equations. (Received September 09, 2017)