Abstract Submitted
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Accelerating Convergence of Generalized Hypergeometric Functions[1] JOSHUA WILLIS, Abilene Christian University — The class of generalized hypergeometric functions ${}_pF_q$ is very broad, encompassing most of the special functions of physics. They can be defined by a power series that, for ${}_{q+1}F_q$, converges when $|z| < 1$. But in many cases of interest, particularly at the branch point $z = 1$, this power series converges too slowly to be computationally useful. Series acceleration techniques can often transform a slowly convergent series into a computationally feasible algorithm, but for complex parameters the generalized hypergeometric function resists most acceleration techniques. In this talk we show how we can accelerate such series, using remainder estimates in terms of inverse power series that can be calculated to any desired asymptotic order. For many cases, this may provide an effective technique to evaluate such functions, particularly near the branch point where direct integration of the differential equation fails.

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