New series expansions of some special functions: Application in numerical evaluation

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Abstract.

In this talk we present a new method to approximate special functions. Considering as a starting point a convenient integral representation of the given special function, we derive new convergent series expansions. The technique consists of replacing part of the integrand by different multi-point Taylor series expansions with base points on the interval of integration. We use these new expansions in the numerical evaluation of special functions, in particular the confluent hypergeometric function $\text{$_1F_1$}$, the hypergeometric function $\text{$_2F_1$}$ and the generalized hypergeometric function $\text{$_3F_2$}$ [1, 2].

References
