

# 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  ${}_1F_1$ , the hypergeometric function  ${}_2F_1$  and the generalized hypergeometric function  ${}_3F_2$  [1, 2].

## References

- [1] López, J.L.; Temme, N.M. New series expansions of the Gauss hypergeometric function. To be published in *Adv. Comput. Math.*
- [2] López, J.L.; Pagola, P.; Pérez Sinusía, E. New series expansions of the  ${}_3F_2$  function. *Submitted.*