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New facts concerning the approximation of the inverse Langevin function

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Highlights

- We present a new method of finding the best approximation of the inverse Langevin function.
- The approach ensures the least relative error between existing solutions and enforces its asymptotic correctness.
- The new approximant may replace approximations formulas used so far to calculate the inverse Langevin function.
- We study extremely long Taylor series expansion of the inverse Langevin function.
- The problem of convergence of the Taylor series expansion of the inverse Langevin function is revisited.
- We compare our results with previous approaches to the same problems.
- A few applications of our proposal are shown and discussed.

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