

Converting divergent weak-coupling expansions into exponentially fast convergent strong-coupling expansions

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Abstract

With the help of a variational method developed in the textbooks [1, 2] we convert the partial sums of order N of divergent series expansions $\sum_{n=0}^N a_n g^n$ of a function $f(g)$ into partial sums $\sum_{n=0}^N b_n g^{-\omega n}$ with some $\omega > 0$. The results of the latter partial sums converge against the exact value of $f(g)$ for g larger than some g_0 , with an error that decreases like $e^{-\text{const.} \times N}$.

References

- [1] H. Kleinert, *Path Integrals in Quantum Mechanics, Statistics, Polymer Physics, and Financial Markets*, World Scientific, Singapore, 2009 (<http://www.physik.fu-berlin.de/~kleinert/b5>).
- [2] H. Kleinert and V. Schulte-Frohlinde, *Critical Phenomena in Φ^4 -Theory*, World Scientific, Singapore, 2001 (<http://www.physik.fu-berlin.de/~kleinert/b8>).