Jovanović, Bora

On approximating by sums of trigonometric and exponential functions.  (English)


The author presents derivation, usage and main features of an algebraic method for approximate analytical representation of tabulated functions along a finite argument interval. The approximation is in the form of a sum of elementary functions, whose discrete values are generated by a special second-order linear recurrence relation with one definition parameter.

These approximations have certain limitations, but they still can give excellent results in various applications for what an example of the approximate representation of planetary positions over a one-year time span is demonstrated. The results obtained by this method and by Chebyshev approximation, widely used in astronomical practice, clearly prove the quality of the first one.

For the entire collection see [Zbl 0981.00012].

Reviewer: Ljubiša Kočinac (Aleksandrovac)

MSC:

65D15 Algorithms for approximation of functions
85-08 Computational methods for problems pertaining to astronomy and astrophysics
65T40 Numerical methods for trigonometric approximation and interpolation
42A10 Trigonometric approximation
41A30 Approximation by other special function classes
85A05 Galactic and stellar dynamics

Keywords:

approximate analytical representation; second-order linear recurrence relation; trigonometric function; exponential function; tabulated functions; planetary positions