

Ware, Antony F.

Fast approximate Fourier transforms for irregularly spaced data. (English) Zbl 0917.65122
SIAM Rev. 40, No. 4, 838-856 (1998).

The author compares various known methods for computing Fourier transforms for irregularly spaced data including

- cubic spline interpolation through values on an equally spaced grid,
- local Chebyshev approximation (due to the author in his Ph.D. thesis, Oxford Univ., Oxford (1991)),
- *J. P. Boyd's* Euler sum [J. Comput. Phys. 103, No. 2, 243-257 (1992; Zbl 0768.65001)],
- approximations of complex exponentials (due to *A. Dutt* and *V. Rokhlin*, SIAM J. Sci. Comput. 14, No. 6, 1368-1393 (1993; Zbl 0791.65108)),
- Lagrange polynomial interpolation,
- local Taylor expansion (due to *C. Anderson* and *M. D. Dahleh*, *ibid.* 17, No. 4, 913-919 (1996; Zbl 0858.65114)),
- multipole method,
- *G. Beylkin's* USFFT [Appl. Comput. Harmon. Anal. 2, No. 4, 363-381 (1995; Zbl 0838.65142)].

Extensive numerical results are included.

Reviewer: G.Steidl (Mannheim)

MSC:

- 65T50** Numerical methods for discrete and fast Fourier transforms
- 42A16** Fourier coefficients, Fourier series of functions with special properties, special Fourier series

Cited in **21** Documents

Keywords:

fast Fourier transforms; Boyd's Euler sum; irregularly spaced data; cubic spline interpolation; local Chebyshev approximation; complex exponentials; Lagrange polynomial interpolation; local Taylor expansion; multipole method; numerical results

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