Fast computation of discrete convolution in reduced number systems for complex Mersenne fields

V.M. Chernov [1,2], O.V. Bespolitov [3]
[1] Image Processing Systems Institute of RAS;
[2] Samara State Aerospace University;
[3] Samara State University

Abstract

The paper considers the problem of fast error-free computation of discrete convolution using number-theoretic transformations in complex Mersenne fields. The computational complexity is reduced by replacing multiplications with shifts of the array of "numbers" when representing the elements of the Mersenne field in the (reduced) number system "with a complex basis".

Keywords: discrete convolution, Mersenne field, error-free computation, array of "numbers".

Citation: Chernov VM, Bespolitov OV. Fast computation of discrete convolution in reduced number systems for complex Mersenne fields. Computer Optics 2002; 24: 126-129.

[Access full text (in Russian)](#)

References

[1] Nussbaumer HJ. Fast Fourier transform and convolution algorithms. Berlin, Heidelberg: Springer-Verlag; 1982.
[2] Knuth DE. The art of computer programming. Vol 2: Seminumerical algorithms. 3nd ed. Boston: Addison-Wesley Longman Publishing Co Inc; 1997.