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Solving singular convolution equations using the inverse fast Fourier transform. (English)

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Appl. Math., Praha 57, No. 5, 543-550 (2012).

The paper is concerned with the application of the convolution theorem of the Fourier transform theory to a singular convolution equation. The use of this theorem via the inverse Fourier transform is well-known for a nonsingular convolution. Apparently, no statement of this kind has been published for the singular equation. The authors present the problem and prove that if the transfer function is a trigonometric polynomial with simple zeros on the unit circle, then they can find the (non-unique) unknown solution by a generalization of the standard process.

Numerical importance of the paper consists in the fact that the authors' generalized solution procedure can be carried out by the discrete Fourier transform via the fast Fourier transform. The authors also present two simple numerical examples of such a process. The paper is interesting for both theoretical and numerical analyst.

Reviewer: Karel Segeth (Praha)

MSC:

42A85 Convolution, factorization for one variable harmonic analysis
65R10 Numerical methods for integral transforms

Cited in **1** Document

Keywords:

singular convolution equation; fast Fourier transform; tempered distribution; polynomial transfer function

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