the numerical and real inversion formula of the Laplace transform

hiroshi fujiwara[1]
tsutomu matsuura[2]
saburou saitoh[3]

[1] kyoto university, japan
[2] gunma university, japan
[3] department of mathematics & CIDMA, university of aveiro

A great variety of problems can be modelled by using differential equations or, in a parallel way, integral equations. In this latter case, integral transforms have a main role in the characterization of the corresponding integral equation. Two of most useful and known integral transforms are the Fourier analysis and the Laplace transform.

To solve the above mentioned equations (or systems of equations), we need to have information about the inverse of the integral transform in use. The problem is that such inverse depends strongly on the spaces under consideration. So, it may even occur that in one framework the inverse transform exists uniquely but in a different framework it may be possible to consider different types of inverses for the same integral transform (or that the inverse simply does not exist).

Typically, the ill-posed problems (i.e., a problem which may have more than one solution, or in which the solutions depend discontinuously upon the initial data) are the most difficult ones.

Within this scope, the numerical and real inversion formula of the Laplace transform is a classical famous ill-posed and very difficult problem. However, corresponding effective formulations have great and fundamental applications.

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