Direct and inverse Cauchy problems for space–time fractional differential equations

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We present some recent advances and investigations on direct and inverse Cauchy problems for generalized space–time fractional differential equations. Indeed, we give explicit solutions of the studied equations [1, 2, 3]. The representation of a solution involves kernels given by convergent infinite series of fractional integro-differential operators [4]. Time-fractional operators of complex orders with respect to a given function are used. We also study inverse Cauchy problems of finding time dependent coefficients for fractional wave and heat type equations, which involve the explicit representation of the solution of the direct Cauchy problem and a recent method to recover variable coefficients for the considered inverse problems. Concrete examples and particular cases of the obtained results are discussed.

References

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