

**SOLUTIONS TO FEW LINEAR FRACTIONAL
INHOMOGENEOUS PARTIAL DIFFERENTIAL EQUATIONS
IN FLUID MECHANICS**

Lokenath Debnath ¹ and Dambaru D. Bhatta ²

Abstract

This paper deals with the solutions of linear inhomogeneous fractional partial differential equations in applied mathematics and fluid mechanics. These equations include general inhomogeneous fractional evolution equation, linear Klein-Gordon equation, linear telegraph equation, and linear fractional Stokes-Ekman equation in geophysical fluid dynamics. Solutions to some linear fractional inhomogeneous equations such as linearised versions of fractional Burgers equation, Kortweg and de Vries (KdV) equations, KdV-Burgers equation are obtained from the solution of the general evolution equation. This is followed by the fractional order linear shallow water equations in a uniformly rotating ocean. The Laplace transform method is used to solve the above inhomogeneous fractional differential equations. It is shown that the corresponding solutions of the integer order partial differential equations follow as special cases of those of fractional partial differential equations.

Mathematics Subject Classification: 26A33, 35A22, 35Q35

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