

**THE TELEGRAPH PROCESS STOPPED
AT STABLE-DISTRIBUTED TIMES AND ITS CONNECTION
WITH THE FRACTIONAL TELEGRAPH EQUATION**

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Abstract

We consider the fractional telegraph equation with partial fractional derivatives of rational order $\alpha = m/n$ with $m < n$.

We prove that the fundamental solution to the Cauchy problem for this equation can be expressed as the distribution of the composition of two processes, one depending on m (denoted by T_m) and the other one depending on n (representing the “time”). In the special case where $m = 1$, T_1 coincides with the classical telegraph process, while T_m , for $m > 1$, is a telegraph process stopped at stable distributed times.

We obtain explicit expressions for the probability distribution of a telegraph process with a random time and for the characteristic function of a telegraph process stopped at stable-distributed times.

Mathematics Subject Classification: 34A05, 60G52, 26A33, 33E12

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