

**Mamchuev, M. O.**

**Modified Cauchy problem for a loaded second-order parabolic equation with constant coefficients.** (English. Russian original) [Zbl 1329.35336](#)

*Differ. Equ.* 51, No. 9, 1137-1144 (2015); translation from *Differ. Uravn.* 51, No. 9, 1147-1153 (2015).

Summary: We give a well-posed statement of the initial value problem for a second-order parabolic equation containing Riemann-Liouville fractional partial derivatives in one of the two independent variables. We prove existence and uniqueness theorems for the solution of this problem.

**MSC:**

[35R11](#) Fractional partial differential equations

[35K15](#) Initial value problems for second-order parabolic equations

Cited in **3** Documents

**Keywords:**

Cauchy problem; well-posedness; fractional partial differential equations; existence; uniqueness

**Full Text:** [DOI](#)

**References:**

- [1] Nakhushhev, A.M., *\textit{Drobnoe ischislenie i ego primeneniye}* (Fractional Calculus and Its Application), Moscow, 2003. · [Zbl 1066.26005](#)
- [2] Pskhu, A.V., *\textit{Uravneniya v chastnykh proizvodnykh drobnogo poryadka}* (Fractional Partial Differential Equations), Moscow: Nauka, 2005. · [Zbl 1193.35245](#)
- [3] Kochubei, A.N., Cauchy problem for fractional diffusion-wave equations with variable coefficients, *Appl. Anal.*, 93, 2211-2242, (2014) · [Zbl 1297.35274](#) · [doi:10.1080/00036811.2013.875162](#)
- [4] Mamchuev, M.O., General representation of the solution of a fractional diffusion equation with constant coefficients in a rectangular domain, *Izv. Kabardino-Balkar. Nauch. Tsentra RAN*, 2, 116-118, (2004)
- [5] Mamchuev, M.O., Boundary value problems for a fractional diffusion equation with constant coefficients, *Dokl. Adyg. (Cherkess) Mezhdunar. Akad. Nauk*, 7, 38-45, (2005)
- [6] Orsinger, E.; Beghin, L., Time-fractional telegraph equations and telegraph processes with Brownian time, *Probab. Theory Related Fields*, 128, 141-160, (2004) · [Zbl 1049.60062](#) · [doi:10.1007/s00440-003-0309-8](#)
- [7] Huang, F., Analytic Solution of the Time-Fractional Telegraph Equation, *\textit{J. Appl. Math.}*, 2009, vol. 2009, Article ID890158, 9 pages.
- [8] Chen, J.; Liu, F.; Anh, V., Analytical solution for the time-fractional telegraph equation by the method of separating variables, *J. Math. Anal. Appl.*, 338, 1364-1377, (2008) · [Zbl 1138.35373](#) · [doi:10.1016/j.jmaa.2007.06.023](#)
- [9] Mamchuev, M.O., Fundamental solution of a second-order loaded parabolic equation with constant coefficients, *Differ. Uravn.*, 51, 611-620, (2015) · [Zbl 1332.35381](#)
- [10] Mamchuev, M.O., Fundamental solution of a system of fractional partial differential equations, *Differ. Uravn.*, 46, 1113-1124, (2010) · [Zbl 1385.76012](#)
- [11] Mamchuev, M.O., Cauchy problem in nonlocal statement for a system of fractional partial differential equations, *Differ. Uravn.*, 48, 351-358, (2012) · [Zbl 1273.35298](#)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.