

Year: 2022

Vol.: 100

Fasc.: 3-4

**Title:** Multi-term time-fractional diffusion equation and system: mild solutions and critical exponents

**Author(s):** Aidyn Kassymov, Niyaz Tokmagambetov and Berikbol Torebek

The paper deals with a multi-term time-fractional semi-linear diffusion equation and system. Firstly, the existence of local mild solutions to the Cauchy problems for the multi-term time-fractional diffusion equation and system are proved. Also, we obtain Fujita-type and Escobedo–Herrero-type critical exponents for the multi-term time-fractional diffusion equation and system, respectively. It is shown that the nonexistence results of solutions depend on the order of the lowest derivatives of the multi-term time-fractional diffusion equation and system.

**Address:**

Aidyn Kassymov  
Department of Mathematics: Analysis,  
Logic and Discrete Mathematics  
Ghent University  
Belgium  
and  
Institute of Mathematics  
and Mathematical Modeling  
Almaty  
Kazakhstan  
and  
Al-Farabi Kazakh National University  
Almaty  
Kazakhstan

**Address:**

Niyaz Tokmagambetov  
Department of Mathematics: Analysis,  
Logic and Discrete Mathematics  
Ghent University  
Belgium  
and  
Institute of Mathematics  
and Mathematical Modeling  
Almaty  
Kazakhstan  
and  
Al-Farabi Kazakh National University  
Almaty  
Kazakhstan

**Address:**

Berikbol Torebek  
Institute of Mathematics  
and Mathematical Modeling  
Almaty  
Kazakhstan  
and  
Department of Mathematics: Analysis,  
Logic and Discrete Mathematics  
Ghent University