

Name of the project topic. Application of q-calculus in solving boundary value problems for fractional order differential equations.

Project goal. The goal of this work is to study and develop methods based on q-calculus for finding solutions to boundary value problems with various boundary conditions associated with differential equations with q-fractional derivatives.

Project Objectives.

To investigate the existence and multiplicity of positive solutions to a boundary value problem of a differential equation with a q-fractional derivative.

To prove the existence and multiplicity of positive solutions to a boundary value problem for a nonlinear q-fractional differential equation using the theorem on a fixed point on a cone in Banach space.

To investigate a sequential differential equation with q-fractional derivatives with Dirichlet-type boundary conditions.

To derive the q-analogue of the Lyapunov type inequality.

To derive a criterion for the absence of real zeros of some Mittag-Leffler q-function.

To give a criterion for the absence of real zeros in the generalized sine q-function.

Research group

No	Full name (if available), education, degree, academic title	Hirsch index, ResearcherID, ORCID, Scopus Author ID (if available)
1	Kosmakova Minzilya Timerbaevna, PhD, associate professor	h-index = 1 (Scopus), h-index = 1 (Web of Science) Scopus Author ID: 58086813500, ORCID: https://orcid.org/0000-0002-6297-5888 ResearcherID: AGY-1561-2022
2	Tokmagambetov Nariman Sarsenovich, PhD	