# A TWO-POINT PROBLEM IN SYSTEMS OF PARTIAL DIFFERENTIAL EQUATIONS

**Iryna Klius**

Department of Higher Mathematics,
National Aviation University,
1, Liubomyra Huzara ave. Kyiv, UKRAINE

E-mail : iryna.klius@npp.nau.edu.ua

**Abstract:** We investigate the correctness of a problem with local two-point conditions in the time variable and periodicity conditions in the spatial coordinates for systems of partial differential equations that are not solvable for the highest time derivative. We establish conditions for the existence and uniqueness of the solution and prove metric theorems to estimate the lower bounds of small denominators that arise during the construction of the solution.

**Keywords and Phrases:** Vector-valued functions, two-point conditions, systems of partial differential equations, Fourier series.

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## 1. Introduction

Interest in the study of multipoint problems for partial differential equations is related both to the significance of their physical interpretation, finding the process described by a given equation when the states of this process are known through several observations, and to the development of a general theory of boundary value problems for partial differential equations.

Multipoint problems for partial differential equations have been studied from various perspectives by many authors [5, 6, 8, 7, 9, 3, 2, 1]. Most of these works addressed cases where the problems were well-posed. However, such problems are