

**OSCILLATION CRITERIA FOR
 SYSTEMS OF PARABOLIC EQUATIONS
 WITH FUNCTIONAL ARGUMENTS**

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ABSTRACT. Sufficient conditions are established for the oscillations of systems of parabolic equations with functional arguments of the form

$$\begin{aligned} \frac{\partial}{\partial t} u_i(x, t) &= a_i(t) \Delta u_i(x, t) + \sum_{k=1}^m \sum_{j=1}^s a_{ikj}(t) \Delta u_k(x, \rho_j(t)) \\ &\quad - \sum_{k=1}^m \sum_{h=1}^l q_{ikh}(x, t) u_k(x, \sigma_h(t)), \\ (x, t) &\in \Omega \times [0, \infty) \equiv G, \quad i = 1, 2, \dots, m, \end{aligned}$$

under boundary conditions of Dirichlet and Neumann type, where Ω is a bounded domain in R^n with a piecewise smooth boundary $\partial\Omega$, and Δ is the Laplacian in Euclidean n -space R^n . These results are illustrated by some examples.

1. Introduction. Recently, the oscillation theory for systems of partial functional differential equations has been studied extensively [3–7]. In this paper, we study the oscillation of systems of parabolic differential equations with functional arguments of the form

$$\begin{aligned} \frac{\partial}{\partial t} u_i(x, t) &= a_i(t) \Delta u_i(x, t) + \sum_{k=1}^m \sum_{j=1}^s a_{ikj}(t) \Delta u_k(x, \rho_j(t)) \\ (1) \quad &\quad - \sum_{k=1}^m \sum_{h=1}^l q_{ikh}(x, t) u_k(x, \sigma_h(t)), \\ &\quad (x, t) \in \Omega \times [0, \infty) \equiv G, \quad i = 1, 2, \dots, m, \end{aligned}$$

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