

Research Report (April, 2019 - March, 2020)

Enrollment from
April 2019

Department of Pure and Applied Physics

Kosuke KITA

I. List of Papers

1. K. Kita, M. Ôtani, "Bounds for global solutions of a reaction diffusion system with the Robin boundary conditions," *Differential Equations & Applications*, 11, no.2 (2019), 227-242.

II. List of Talks

1. 喜多航佑, "非線形境界条件を伴う非線形熱方程式の大域解の有界性について," 第 41 回発展方程式若手セミナー, 群馬, 2019 年 8 月.
2. 喜多航佑・大谷光春, "On the uniform boundedness for global solutions of nonlinear heat equations with nonlinear boundary conditions in bounded domain," 日本数学会 2019 年度秋季総合分科会, 金沢大学, 2019 年 9 月.
3. 喜多航佑, "On some parabolic equations with nonlinear boundary conditions of radiation type," 東北大学 OS 特別セミナー, 東北大学, 2019 年 11 月.
4. 喜多航佑・大谷光春, "A bound for global solutions of some parabolic equation with nonlinear boundary conditions," 第 45 回 発展方程式研究会, 日本女子大学, 2019 年 12 月.

III. Research Results in AY2019

In 2019, I studied on the initial-boundary problem of parabolic equations with nonlinear boundary conditions of radiation type. From physical point of view, there are many mathematical models such that it could be more natural to consider nonlinear boundary conditions rather than linear boundary conditions, i.e., the homogeneous Dirichlet boundary condition or Neumann boundary condition. We proved the local well-posedness of the above problem and derived uniform bounds of suitable norms of time-global solutions. Moreover, we developed an abstract comparison theorem for strong solutions of second order parabolic equations with nonlinear boundary conditions.

IV. Research Plan for AY2020

In 2020, I am going to consider elliptic equations and parabolic equations with nonlinear boundary conditions of radiation-absorption type. I will also study parabolic and elliptic equations with nonlinear boundary conditions in unbounded domain such as exterior domain and half-space.