

Second-order elliptic and parabolic systems with nonlocal Robin-type boundary conditions

Seick KIM¹

1) *Department of Mathematics, Yonsei University, Seoul 120-749, KOREA*

Corresponding Author : Seick KIM, kimseick@yonsei.ac.kr

ABSTRACT

In recent years, there has been increasing interest in nonlocal phenomena. In this talk, I will describe how to set up general nonlocal Robin-type boundary value problems in the Hilbert space setting for second order elliptic and parabolic systems in divergence form with bounded measurable coefficients satisfying the strong ellipticity condition. Then I will indicate how to get improved regularity for weak solutions under additional assumptions on the coefficients and the domains. I will also mention recent work with Jongkeun Choi regarding Green's function estimates for elliptic and parabolic systems with nonlocal Robin-type boundary conditions. Finally, I will talk about possible application to a fluid-structure interaction problem recently investigated by Chohong Min and Frédéric Gibou, where a Poisson problem with nonlocal Robin-type boundary condition arises in a natural fashion.

*This is an abstract for a survey talk and not intended for publication.

REFERENCES

1. Choi, J. and Kim, S., "Green's functions for elliptic and parabolic systems with Robin-type boundary conditions", *Journal of Functional Analysis*, Vol. 267, no. 9, 2014, pp. 3205-3261.
2. Min, C. and Gibou, F., "Efficient symmetric positive definite second-order accurate monolithic solver for fluid/solid interactions", *Journal of Computational Physics*, Vol. 231, no. 8, 2012, pp. 3246-3263.