Regularizing properties of periodic layer heat potentials and application to transmission problems

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As is well known, integral equation methods based on layer heat potentials have been largely exploited for solving corresponding boundary value problems in bounded domains. In this talk we wish to provide analogous tools in order to analyze the behavior of the temperature in an unbounded space-periodic domain.
First we present some regularizing properties for classical layer heat potential, then exploiting these results together with an analysis of the periodic fundamental solution of the heat equation, we can prove some regularizing properties in parabolic Schauder spaces for the periodic case. As an application we consider a transmission problem for the heat equation in a periodic setting.

Part of the results of the talk have been obtained in collaboration with Massimo Lanza de Cristoforis (Università degli Studi di Padova).