Heat Kernel Asymptotics of Zaremba Boundary Value Problem

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The Zaremba boundary-value problem is a boundary value problem for Laplace-type second-order partial differential operators acting on smooth sections of a vector bundle over a smooth compact Riemannian manifold with smooth boundary but with non-smooth (singular) boundary conditions, which include Dirichlet conditions on one part of the boundary and Neumann ones on another part of the boundary. We study the heat kernel asymptotics of Zaremba boundary value problem. The construction of the global parametrix of the heat equation is described and some first non-trivial coefficients of the heat kernel asymptotic expansion are computed explicitly.