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ON AN UPPER HEAT KERNEL BOUND FOR SECOND ORDER ELLIPTIC OPERATORS ON BOUNDED REGIONS IN $\mathbb{R}^N$

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Abstract. We revisit an upper heat kernel bound for second order uniformly elliptic operators H defined on bounded regions Ω in $\mathbb{R}^N$. This bound is of the type

$$K_H(t,x,y) \leqslant c_1 \max\{t^{-(\frac{N}{2}+a)},1\} e^{-E_1 t} \exp\left\{\frac{-|x-y|^2}{8\Lambda t}\right\} \phi_1(x)\phi_1(y)$$

where E_1 and ϕ_1 are, respectively, the ground state eigenvalue and the normalized ground state eigenfunction of H, Λ is the upper ellipticity constant of H, $a>0$ is a constant related to a lower bound of ϕ_1 near the boundary $\partial\Omega$, and $c_1>0$ is a constant which depends on Ω, E_1, the ellipticity constants of H, and a lower bound of ϕ_1 near $\partial\Omega$. In particular, this bound provides a corrected version of a bound originally studied in [2] for large time $t>0$.

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