

Refined semiclassical asymptotics of the Laplace operator on bounded domains

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Let $-\Delta$ denote the Dirichlet Laplace operator on a bounded domain in \mathbb{R}^d . We study the trace of the negative part of $-\Delta - \mu$ in the semiclassical limit as μ tends to infinity. We give a new proof that yields not only the first term of the asymptotics but also the second term involving the surface area of the boundary of the domain.

The proof works under very general conditions on the domain; in particular we do not require smoothness of the boundary. Furthermore the method can be applied to non-local, non-smooth symbols, like fractional powers of the Laplacian.

(This is joint work with R. L. Frank.)