



MAFIA - the seminar you can't refuse

Gradient estimates for the heat kernel on Riemannian manifolds

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Abstract: Euclidean-type estimates for the heat kernel on a Riemannian manifold are well-understood: thanks to the works of many authors (Varopoulos, Saloff-Coste, Grigoryan, Coulhon, etc), they are known to be characterised by the validity of certain functional inequalities on the manifold, such as the Sobolev inequality for instance.

Much less is known concerning the gradient of the heat kernel. Pointwise bounds of Euclidean-type are available if the Ricci curvature is non-negative, but almost nothing is known beyond this stringent curvature assumption.

We will present some new results in this respect, for manifolds having a “small amount” of negative Ricci curvature at infinity, in an integral sense. In particular, we will present gradient estimates for the heat kernel on asymptotically locally Euclidean manifolds.