

HEAT KERNEL ASYMPTOTICS AT THE CUT LOCUS ON RIEMANNIAN AND SUB-RIEMANNIAN MANIFOLDS

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In this talk I will discuss the asymptotics of the heat kernel $p_t(x, y)$ on a Riemannian or sub-Riemannian manifold. We will consider the small time asymptotics, both off-diagonal and at the cut locus, showing how the asymptotic of $p_t(x, y)$ behave depending on whether (and how much) y is conjugate to x . Our results are obtained by extending an idea of Molchanov from the Riemannian to the sub-Riemannian case, and some details we get appear to be new even in the Riemannian context.

If time permits I will discuss how these techniques let us to identify the possible asymptotics for the heat kernel at the cut locus for a generic Riemannian manifolds (of dimension less or equal than 5). This is a consequence of the fact that, among the stable singularities of Lagrangian maps appearing in the classification of Arnold, only two of them can appear as “optimal”, i.e. along minimizing geodesics.

References

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2. *D. Barilari, J. Jendrej*. Small time heat kernel asymptotics at the cut locus on surfaces of revolution, *Ann. Inst. Henri Poincaré, Anal. Non Linéaire* 31 (2014), pp. 281–295.
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