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HEAT KERNEL ON NILPOTEN LIE GROUPS

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I will discuss the structure of the integral representation of the heat kernels of sub-Laplacian and Laplacian on 2-step nilpotent Lie groups. Mainly I illustrate the role of the complex Hamilton-Jacobi theory and a similar quantity with Van-Vleck determinant in the integral representation of heat kernels. Then I will explain the hierarchy between heat kernels on homogeneous manifolds of nilpotent Lie groups. Finally I will talk about the possibility toward the construction of the heat kernel for Engel group (= the lowest dimensional 3-step case) and spectral asymptotics of sub-Laplacian on Heisenberg manifolds.

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