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Leibniz  
Universität  
Hannover

Oberseminar  
Analysis und Theoretische Physik

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Small time asymptotics on the diagonal for  
Hörmander's type hypoelliptic operators

We consider the heat equation associated to second order Hörmander operators, possibly with a drift term. Under the assumption of weak Hörmander's condition of hypoellipticity, we study the small time asymptotics of the heat kernel at a stationary point  $x_0$  of the drift field. We show that the order of decay depends on the controllability of an associated control problem and of its approximating system: if the control problem of the approximating system is controllable at  $x_0$ , then the fundamental solution has a polynomial decay as  $t^{-N/2}$ . The integer  $N$  is determined only by the Lie algebra at  $x_0$  of the fields, which define the hypoelliptic operator, and generalizes the homogeneous dimension, that appears in the sub-Riemannian case without drift.

For the special class of operators with constant second order term and linear drift, we characterize geometrically the higher order coefficients of the expansion on the diagonal.

**Dienstag, 17.11.2015, 15:00h, Raum g005  
Hauptgebäude der Leibniz Universität**

Dazu laden herzlich ein:  
Prof. Dr. Wolfram Bauer  
Prof. Dr. Joachim Escher  
Prof. Dr. Olaf Lechtenfeld  
Prof. Dr. Elmar Schrohe  
Prof. Dr. Christoph Walker

Weitere Informationen finden Sie auch unter [http://www.ifam.uni-hannover.de/os\\_analysis.html](http://www.ifam.uni-hannover.de/os_analysis.html)