立命館大学数理科学科談話会

来る**9月1日（木）**に立命館大学数理科学科談話会が行われます．みなさまのご参加をお待ちいたしております．

日時：**2022年9月1日（木）16:30〜17:30**

開催方法：Zoom ミーティングにて配信いたします．下記の URL より 8 月 31 日（水）までにご登録ください．当日お昼ごろまでに Zoom ミーティングの情報をお知らせいたします．

https://ritsumei-ac-jp.zoom.us/meeting/register/tJAlcuuoqjIoGNAT1cjnIZew1RYHFE5nuIOU

講演者：

Wolfram Bauer 氏

(Leibniz Universität Hannover)

タイトル：

Subriemannian geometry and analysis of associated operators

アブストラクト：

Subriemannian (SR) geometry models motions under non-holonomic constraints. From an analytical point of view it provides a geometric framework for the study of (some) hypoelliptic operators. We give a short introduction to SR geometry and provide basic examples of SR manifolds and their various applications. If the SR structure is equi-regular we can assign to it an intrinsic sub-Laplace operator generalizing the Beltrami-Laplace operator in Riemannian geometry.

We discuss the corresponding heat equation and properties of the heat kernel in this subelliptic setting. For different types of SR manifolds new results on the asymptotic expansion of the heat kernel for small times are presented. We first consider Carnot groups which form the local model of a SR manifold and their quotients by a lattice (compact nilmanifolds). In a second step we discuss H-type foliations. They form a class of "non-flat" examples in SR geometry and we explain the role of their "horizontal and vertical curvature" in the heat kernel asymptotic.

Pseudo-H type nilmanifolds are SR manifolds with a fiberwise non-positive definite quadratic form and they induce another type of operator called ultra-hyperbolic. If time permits we answer the problem of local solvability and construct an explicit inverse. This talk is based on joint work with A. Froehly, A. Laaroussi, I. Markina, G. Molino.

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