

Abstract

The aim of this mini course is to introduce some results and motivations for the development of Geometric Measure Theory in stratified groups. This is a relatively recent research area, at the crossroads of Differential Geometry, classical Geometric Measure Theory and Analysis in metric spaces. We mainly focus on the divergence theorem with respect to the intrinsic surface measure of a stratified Lie group, where the group is generated by left invariant Hörmander vector fields.

Main contents of the course.

Part I

I.1 - A few words on Geometric Measure Theory

I.2 - Rectifiable sets and Hausdorff measures

I.3 - Some motivations for stratified groups

I.4 - Stratified groups

I.5 - Hausdorff dimension of subsets and unrectifiability

I.6 - Heisenberg group

Part II

II.1 - Perimeter measure and divergence theorem in the Euclidean setting

II.2 - h -Perimeter measure in stratified groups

II.3 - h -Perimeter measure in the smooth case.

II.4 - Characteristic points and their negligibility

II.5 - Relationship between $|\partial_H E|$ and \mathcal{S}^{Q-1}

II.6 - C_H^1 functions, \mathbb{G} -rectifiability and structure of $\mathcal{F}_H E$