

Currents in the Heisenberg Group

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Abstract

Currents in \mathbb{R}^n , that is, linear functionals from the space of differential forms to \mathbb{R} , are an important tool in the study of the Plateau problem on Riemannian manifolds. In particular, a recent result about them is given in the paper by Casteras, Holopainen and Ripoll in 2015 (<http://arxiv.org/pdf/1507.07311v2.pdf>), where they solve the asymptotic Plateau problem in some Cartan-Hadamard manifolds using locally rectifiable currents *mod* 2.

The major goal of my study is to move some of these results and the ideas behind them to the sub-Riemannian setting and to study the Plateau problem on sub-Riemannian manifolds. The starting point was the paper by Franchi, Serapioni and Serra Cassano in 2007 (Regular submanifolds, graphs and area formula in Heisenberg groups) where a definition of currents in the Heisenberg group \mathbb{H}^n is given. Next intermediate steps are now a deeper understanding of sub-Riemannian currents in \mathbb{H}^1 and \mathbb{H}^2 , the study of sub-Riemannian currents *mod* p and the analysis of some properties of currents that are likely to move from the Riemannian to the sub-Riemannian setting.

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