

## WEIGHTED POINCARÉ INEQUALITIES ON HALF SPACES IN CARNOT GROUPS

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*Abstract.* We prove some weighted Poincaré inequalities on half spaces for the sublaplacian in Carnot groups. Furthermore, the constants we obtain are sharp.

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### REFERENCES

- [1] A. BONFIGLIOLI, E. LANCONELLI AND F. UGUZZONI, *Stratified Lie Groups and Potential Theory for Their Sub-Laplacians*, Springer Monographs in Mathematics, Springer, Berlin, 2007.
- [2] L. CAPOGNA, D. DANIELLI, S. PAULS, J. TYSON, *An introduction to the Heisenberg group and the sub-Riemannian isoperimetric problem*, in: Progress in Mathematics, vol. 259, Birkhäuser Verlag, Basel, 2007.
- [3] F. FERRARI AND E. VALDINOCI, *Some weighted Poincaré inequalities*, Indiana Univ. Math. J., **58**, 4 (2009), 1619–1637.
- [4] S. FILIPPAS, A. TERTIKAS AND J. TIDBLUM, *On the structure of Hardy-Sobolev-Maz'ya inequalities*, J. Eur. Math. Soc., **11**, 6 (2009), 1165–1185.
- [5] A. I. NAZAROV, *Hardy-Sobolev inequalities in a cone*, J. Math. Sci., **132**, 4 (2006), 419–427.
- [6] G. B. FOLLAND AND E. M. STEIN, *Hardy spaces on homogeneous groups*, Princeton University Press, Princeton, NJ, 1982.
- [7] D. SU, Q. YANG, *On the best constants of Hardy inequality in  $\mathbb{R}^{n-k} \times (\mathbb{R}_+)^k$  and related improvements*, J. Math. Anal. Appl., **389**, (2012), 48–53.
- [8] Y. XIAO, *Some sharp Poincaré inequalities with weights on Carnot groups*, Bull. Malays. Math. Sci. Soc., **37**, 3 (2014), 661–669.
- [9] Q. YANG, B. LIAN, *On the best constant of weighted Poincaré inequalities*, J. Math. Anal. Appl., **377**, (2011), 207–215.