

Continuity properties for some operators arising in non-commutative harmonic analysis

Duván Cardona
Ghent University, Belgium

July 2023

Abstract: The non-commutative harmonic analysis on nilpotent Lie groups after the developments by Folland and Stein in the 70's has been fundamental for the analysis of hypoelliptic problems on graded Lie groups. They started the program of generalising in the setting of nilpotent Lie groups the results available in the Eucliden harmonic analysis. Several fundamental results in this area have been obtained in the last 40 years. In this setting, we review some recent results about the boundedness of oscillating Fourier multipliers, pseudo-differential operators and other operators arising in the harmonic analysis of graded Lie groups. The results in this talk are based on my joint works in the last years with M. Ruzhansky (Ghent-Belgium) and J. Delgado (Cali-Colombia).

References

1. Cardona, D. Ruzhansky, M. Björk-Sjölin condition for strongly singular convolution operators on graded Lie groups, *Math. Z.* 302, 1957–1981 (2022).
2. Cardona, D. Ruzhansky, M. Oscillating singular integral operators on compact Lie groups revisited., *Math. Z.* Vol. 303, 26 (2023).
3. Cardona, D., Delgado, J., Ruzhansky, M. Lp-bounds for pseudo-differential operators on graded Lie groups. *J. Geom. Anal.* Vol. 31, 11603–11647, (2021).
4. Fefferman, C.: Inequalities for strongly singular integral operators. *Acta Math.* 24, 9–36 (1970).
5. Fefferman, C., Stein, E.: Hp spaces of several variables. *Acta Math.* 129, 137–193 (1972).
6. Folland, G., Stein, E.: *Hardy Spaces on Homogeneous Groups*. Princeton University Press, Princeton (1982).