

SOME INTERPOLATIONS AND REFINEMENTS OF HADAMARD'S INEQUALITY FOR r -CONVEX FUNCTIONS IN CARNOT GROUPS

DAH-YAN HWANG

Abstract. Some nontrivial increasing functions will be interpolated in the Hadamard's inequality for r -convex function in Carnot groups. The methods are more natural and allow us to extend the condition $\Gamma^2(G) \cap C_{H,r}^w(G)$ to the condition $C(G) \cap C_{H,r}^w(G)$.

Mathematics subject classification (2000): 26D15, 49L25.

Key words and phrases: r -convex function, extended means; Carnot group, Hadamard's inequality, inequality.

REFERENCES

- [1] D. DANIELLI, N. GAROFALO AND D. NHIEU, *Notions of convexity in Carnot groups*, Comm. Anal. Geom., **11**, (2003), 263–341.
- [2] G. B. FOLLAND, E. M. STEIN, *Hardy Space on Homogenous Groups*, Princeton Univ. Press, Princeton, NJ, 1982.
- [3] P. M. GILL, C. E. M. PEARCE AND J. PEČARIĆ, *Hadamard's inequality for r -convex functions*, J. Math. Anal. App., **215**, (1997), 461–470.
- [4] G. LU, J. J. MANFREDI AND B. STROFFOLINI, *Convex function on the Heisenberg group*, Calc. Var. Partial Differential Equations, **19**, (2003), 1–22.
- [5] P. PANSU, *Métriques de Carnot-Carathéodory et quasiisométries des symétriques de rang un*, Ann. Math., **129**, (1989), 99–109.
- [6] C. E. M. PEARCE, J. PEČARIĆ, *A continuous analogue and extension of Rado's formulae for convex and concave functions*, Bull. Austral. Math. Soc., **53**, (1996), 229–233.
- [7] C. E. M. PEARCE, J. PEČARIĆ, AND V. ŠIMIĆ, *Stolarsky means and Hadamard's inequality*, J. Math. Anal. Appl., **220**, (1998), 99–109.
- [8] K. B. STOLARSKY, *Generalization of the logarithmic mean*, Math. Mag., **48**, (1975), 87–92.
- [9] M. SUN, *Inequalities for two-parameter mean of convex functions*, Math. Practice Theory, **27**, (1997), 193–197 (in Chinese).
- [10] M. SUM, X. YANG, *Generalized Hadamard's inequality and r -convex functions in Carnot groups*, J. Math. Anal. Appl., **294**, (2004), 387–398.
- [11] B. UHRIN, *Some remarks about the convolution of unimodal functions*, Ann. Probab., **12**, (1984), 640–645.
- [12] G.-S. YANG, D.-Y HWANG, *Refinements of Hadamard's inequality for r -convex functions*, Indian J. Pure Appl. Math., **32**, (2001), 1571–1579.