

Dou, Jingbo; Han, Yazhou

Ostrowski type inequalities related to the generalized Baouendi-Grushin vector fields. (English) [Zbl 1273.26023](#)

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Summary: We employ a new method to prove a representation formula related to the generalized Baouendi-Grushin vector fields, and then the Ostrowski-type inequalities are established in the ball and bounded domain, respectively, via the representation formula and L^∞ norm of the horizontal gradient. In addition, in the same spirit, we show the Hardy inequalities with boundary term related to the generalized Baouendi-Grushin vector fields.

MSC:

26D10 Inequalities involving derivatives and differential and integral operators

35J70 Degenerate elliptic equations

Keywords:

generalized Baouendi-Grushin vector fields; representation formula; Ostrowski type inequality; Hardy inequality

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References:

- [1] ADIMURTHI, Hardy-Sobolev inequality in $H^1(V)$ and its applications, *Commun. Contemp. Math.*, 4 (2002), pp. 409-434.
- [2] ADIMURTHI - M. ESTEBAN, An improved Hardy-Sobolev inequality in $W^{1,p}(V)$ and its application to Schrödinger operator, *NoDEA Nonl. Diff. Equa. Appl.*, 12 (2005), pp. 243-263. · [Zbl 1089.35035](#) · [doi:10.1007/s00030-005-0009-4](#)
- [3] G. A. ANASTASSIOU, *Quantitative Approximations*, Chapman and Hall/CRC, Boca Raton/New York, 2001.
- [4] G. A. ANASTASSIOU - J. A. GOLDSTEIN, Ostrowski type inequalities over Euclidean domains. *Rend. Linc. Matem. Appl.*, 18 (2007), pp. 305-310. · [Zbl 1142.26011](#) · [doi:10.4171/RLM/497](#)
- [5] G. A. ANASTASSIOU - J. A. GOLDSTEIN, Higher order Ostrowski type inequalities over Euclidean domains, *J. Math. Anal. Appl.*, 337 (2008), pp. 962-968. · [Zbl 1144.26024](#) · [doi:10.1016/j.jmaa.2007.04.033](#)
- [6] L. CAFFARELLI - L. SILVESTRE, An extension problem related to the fractional Laplacian, *Comm. Part. Diff. Eqs.*, 32 (2007), pp. 1245-1260. · [Zbl 1143.26002](#) · [doi:10.1080/03605300600987306](#) · [arxiv:math/0608640](#)
- [7] W. COHN - G. LU, Best constants for Moser-Trudinger inequalities on the Heisenberg group, *India. Univ. Math. J.*, 50 (2001), pp. 1567-1591. · [Zbl 1019.43009](#) · [doi:10.1512/iumj.2001.50.2138](#)
- [8] L. D'AMBROSIO, Hardy inequalities related to Grushin type operators, *Proc. Amer. Math. Soc.*, 132 (2004), pp. 725-734. · [Zbl 1049.35077](#) · [doi:10.1090/S0002-9939-03-07232-0](#)
- [9] L. D'AMBROSIO, Hardy type inequalities related to second order degenerate differential operators, *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)* 4 (2005), pp. 451-486. · [Zbl 1170.35372](#) · [eudml:84567](#) · [arxiv:math/0603187](#)
- [10] L. D'AMBROSIO - S. LUCENTE, Nonlinear Liouville theorems for Grushin and Tricomi operators, *J. Diff. Eqs.*, 193 (2003), pp. 511-541. · [Zbl 1040.35012](#) · [doi:10.1016/S0022-0396\(03\)00138-4](#)
- [11] J. DOU - G. GUO - P. NIU, Hardy inequalities with remainder terms for the generalized Baouendi-Grushin vector fields, *Math. Ineq. Appl.*, 13 (2010), pp. 555-570. · [Zbl 1190.26008](#) · [files.ele-math.com](#)
- [12] Y. DONG - G. LU - L. SUN, Global Poincaré Inequalities on the Heisenberg Group and Applications, *Acta Mathematica Sinica, English Series.*, 23 (2007), pp. 735-744. · [Zbl 1131.46024](#) · [doi:10.1007/s10114-005-0874-0](#)
- [13] B. FRANCHI - E. LANCONELLI, Hölder regularity theorem for a class of linear nonuniformly elliptic operators with measurable coefficients, *Ann. Scuola Norm. Sup. Pisa Cl. Sci. (4)* 10 (1983), pp. 523-541. · [Zbl 0552.35032](#) · [numdam:ASNSP_1983_4_10_4_523_0](#) · [eudml:83915](#)
- [14] G. B. FOLLAND - E. M. STEIN, *Hardy spaces on homogeneous groups*, Princeton University Press, Princeton, NJ, 1982. · [Zbl 0508.42025](#)
- [15] B. FRANCHI - E. LANCONELLI, An embedding theorem for Sobolev spaces related to non-smooth vector fields and Harnack inequality, *Comm. Part. Diff. Eqs.*, 9 (1984), pp. 1237-1264. · [Zbl 0589.46023](#) · [doi:10.1080/03605308408820362](#)
- [16] B. LIAN - Q. YANG, Ostrowski type inequalities on H-type groups, *J. Math. Anal. Appl.*, 365 (2010), pp. 158-166. · [Zbl 1184.26022](#) · [doi:10.1016/j.jmaa.2009.10.030](#)

- [17] Z. LIU, Some Ostrowski type inequalities, *Math. Comp. Model.*, 48 (2008), pp. 949-960. · [Zbl 1156.26305](#) · [doi:10.1016/j.mcm.2007.12.004](#)
- [18] H. LIU - J. LUAN, Ostrowski type inequalities in the Grushin plane, *J. Ineq. Appl.* 2010, Article ID 987484, pp. 1-9. · [Zbl 1185.26045](#) · [doi:10.1155/2010/987484](#) · [eudml:223763](#)
- [19] P. NIU - J. DOU - H. ZHANG, Nonexistence of weak solutions for the p-degenerate subelliptic inequalities constructed by the generalized Baouendi-Grushin vector fields, *Georgian Math. J.*, 12 (2005), pp. 723-738. · [Zbl 1099.35184](#)

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