

ON SOME OSTROWSKI TYPE INEQUALITIES ON FRACTAL SETS VIA GENERALIZED STRONGLY m -CONVEX MAPPINGS

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ABSTRACT. In this paper, two inequalities of Ostrowski type are established for generalized strongly m -convex functions on the fractal sets $\mathbb{R}^\alpha$ ($0 < \alpha \leq 1$) of real line numbers. Special cases of our main results are discussed and some applications in numerical integration and for generalized means are given.

REFERENCES

- [1] P. Agarwal, *Some inequalities involving Hadamard type k -fractional integral operators*, Math. Methods Appl. Sci., **40** (2017), 3882-3891.
- [2] P. Agarwal, M. Jleli and M. Tomar, *Certain Hermite–Hadamard type inequalities via generalized k -fractional integrals*, J. Inequal. Appl., 2017 (2017), 10 pp.
- [3] G. Anastassiou, *Fractional Differentiation Inequalities*, Springer, NY, Heidelberg, 2009.
- [4] G. Anastassiou, *Advances on Fractional Inequalities*, Springer, NY, 2011.
- [5] G. Anastassiou, *Intelligent Mathematics: Computational Analysis*, Springer, Heidelberg, New York, 2011.
- [6] G. Anastassiou, A. Kashuri and R. Liko, *Local fractional integrals involving generalized strongly m -convex mappings*, Arab. J. Math., 8(2) (2019), 95-107.
- [7] H. Budak, M. Z. Sarikaya and H. Yildirim, *New inequalities for local fractional integrals*, Iran. J. Sci. Technol. Trans. Sci., 41 (2017), 1039-1046.
- [8] J.-S. Choi, E. Set and M. Tomar, *Certain generalized Ostrowski type inequalities for local fractional integrals*, Commun. Korean Math. Soc., 32(3) (2017), 601-617.
- [9] T. S. Du, H. Wang and A. Khan, *Certain integral inequalities considering generalized m -convexity on fractal sets and their applications*, Fractals, 27(7) (2019), 17 pp.
- [10] S. Erden and M. Z. Sarikaya, *Generalized Pompeiu type inequalities for local fractional integrals and its applications*, Appl. Math. Comput., 274 (2016), 282-291.
- [11] G. Jumarie, *Table of some basic fractional calculus formulae derived from a modified Riemann–Liouville derivative for non-differentiable functions*, Appl. Math. Lett., 22 (2009), 378-385.
- [12] T. Lara, N. Merentes, R. Quintero and E. Rosales, *On strongly m -convex functions*, Math. Aeterna, 5(3) (2015), 521-535.
- [13] T. Lara, N. Merentes and R. Quintero, *On inequalities of Fejér and Hermite–Hadamard types for strongly m -convex functions*, Math. Aeterna, 5(5) (2015), 777-793.
- [14] H.-X. Mo, *Generalized Hermite–Hadamard inequalities involving local fractional integral*, Arxiv, 2014 (2014), 8 pp.
- [15] H.-X. Mo and X. Sui, *Generalized s -convex functions on fractal sets*, Abstr. Appl. Anal., 2014 (2014), 8 pp.
- [16] H.-X. Mo and X. Sui, *Hermite–Hadamard type inequalities for generalized s -convex functions on real linear fractal set $\mathbb{R}^\alpha$ ($0 < \alpha \leq 1$)*, Math. Sci. (Springer), 11 (2017), 241-246.
- [17] H.-X. Mo, X. Sui and D.-Y. Yu, *Generalized convex functions on fractal sets and two related inequalities*, Abstr. Appl. Anal., 2014 (2014), 7 pp.
- [18] M. Z. Sarikaya and H. Budak, *Generalized Ostrowski type inequalities for local fractional integrals*, Proc. Amer. Math. Soc., 145 (2017), 1527-1538.

2010 *Mathematics Subject Classification*. Primary: 26A51; Secondary: 26A33, 26D07, 26D10, 26D15.

Key words and phrases. Local fractional derivative, Local fractional integral, Fractal space, Generalized Hölder inequality, Generalized power mean inequality, Generalized convex functions.

- [19] M. Z. Sarikaya, S. Erden and H. Budak, *Some generalized Ostrowski type inequalities involving local fractional integrals and applications*, Adv. Inequal. Appl., 2016(6) (2016), 16 pp.
- [20] M. Z. Sarikaya, M. Tunç and H. Budak, *On generalized some integral inequalities for local fractional integrals*, Appl. Math. Comput., 276 (2016), 316-323.
- [21] E. Set and M. Tomar, *New inequalities of Hermite–Hadamard type for generalized convex functions with applications*, Facta Univ. Ser. Math. Inform., 31 (2016), 383-397.
- [22] H. M. Srivastava and J.-S. Choi, *Zeta and q -Zeta functions and associated series and integrals*, Elsevier, Inc., Amsterdam, 2012.
- [23] M. Tomar, P. Agarwal, M. Jleli and B. Samet, *Certain Ostrowski type inequalities for generalized s -convex functions*, J. Nonlinear Sci. Appl., 10 (2017), 5947-5957.
- [24] X.-J. Yang, *Generalized local fractional Taylor's formula with local fractional derivative*, Arxiv, 2011 (2011), 5 pp.
- [25] X.-J. Yang, *Local fractional functional analysis and its applications*, Asian Academic publisher Limited, Hong Kong, 2011.
- [26] X.-J. Yang, *Advanced local fractional calculus and its applications*, World Science Publisher, New York, 2012.
- [27] X.-J. Yang, *Local fractional Fourier analysis*, Adv. Mech. Eng. Appl., 1 (2012), 12-16.
- [28] X.-J. Yang, *Local fractional integral equations and their applications*, Adv. Comput. Sci. Appl., 1 (2012), 234-239.
- [29] Y.-J. Yang, D. Baleanu and X.-J. Yang, *Analysis of fractal wave equations by local fractional Fourier series method*, Adv. Math. Phys., 2013 (2013), 6 pp.

Received 19 February 2020

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