

## ON WEIGHTED MONTGOMERY IDENTITY FOR RIEMANN-LIOUVILLE FRACTIONAL INTEGRALS

MEHMET ZEKI SARIKAYA and HATICE YALDIZ

**Abstract.** In this paper, we extend the weighted Montogomery identity for the Riemann-Liouville fractional integral. We also use this Montogomery identity to establish some new weighted Ostrowski type integral inequalities.

**MSC 2010.** 26D15, 41A55, 26D10.

**Key words.** Riemann-Liouville fractional integral, Ostrowski inequality.

### REFERENCES

- [1] ANASTASSIOU, G., HOOSHMANDSL, M.R., GHASEMI, A. and MOFTAKHARZADEH, F., *Montgomery identities for fractional integrals and related fractional inequalities*, J. Inequal. in Pure and Appl. Math., **10** (4) (2009), Art. 97, 6 pages.
- [2] BELARBI, S. and DAHMANI, Z., *On some new fractional integral inequalities*, J. Inequal. in Pure and Appl. Math., **10** (3) (2009), Art. 86, 5 pages.
- [3] CERONE, P. and DRAGOMIR, S.S., *Trapezoidal type rules from an inequalities point of view*, Handbook of Analytic-Computational Methods in Applied Mathematics, CRC Press N.Y. (2000).
- [4] DAHMANI, Z., TABHARIT, L. and TAF, S., *Some fractional integral inequalities*, Non-linear Science Letters A, **2** (1), 2010, 155–160.
- [5] DAHMANI, Z., TABHARIT, L. and TAF, S., *New inequalities via Riemann-Liouville fractional integration*, J. Advance Research Sci. Comput., **2** (1) (2010), 40–45.
- [6] DRAGOMIR, S.S. and BARNETT, N.S., *An Ostrowski type inequality for mappings whose second derivatives are bounded and applications*, RGMIA Research Report Collection, V.U.T., **1** (1999), 67–76.
- [7] DRAGOMIR, S.S., *An Ostrowski type inequality for convex functions*, Univ. Beograd. Publ. Elektrotehn. Fak. Ser. Mat., **16** (2005), 12–25.
- [8] GORENFLO, R. and MAINARDI, F., *Fractionalcalculus: integral and differentiable equations of fractional order*, Springer Verlag, Wien, 1997, 223–276.
- [9] DUOANDIKOETXEA, J., *A unified approach to several inequalities involving functions and derivatives*, Czechoslovak Mathematical Journal, **51** (126) (2001), 363–376.
- [10] LIU, Z., *Some companions of an Ostrowski type inequality and application*, J. Inequal. in Pure and Appl. Math., **10** (2) (2009), Art. 52, 12 pages.
- [11] MITRINOVIC, D.S., PECHARIC, J.E. and FINK, A. M., *Inequalities involving functions and their integrals and derivatives*, Kluwer Academic Publishers, Dordrecht, 1991.
- [12] OSTROWSKI, A.M., *Über die Absolutabweichung einer differentierbaren Funktion von ihrem Integralmittelwert*, Comment. Math. Helv., **10** (1938), 226–227.
- [13] PECHARIC, J., *On the Cebysev inequality*, Buletinul Științific și Tehnic al Institutului Politehnic “Traian Vuia” Timișoara, **25** (1980), 5–9.
- [14] SAMKO, S.G., KILBAS, A.A. and MARICHEV, O.I., *Fractional Integrals and Derivatives Theory and Application*, Gordon and Breach Science, New York, 1993.
- [15] SARIKAYA, M.Z., *On the Ostrowski type integral inequality*, Acta Math. Univ. Comenianae, **79** (2010), 129–134.

- [16] SARIKAYA, M.Z., *On the Ostrowski type integral inequality for double integrals*, Demonstratio Mathematica, **45** (2012), 533–540.
- [17] SARIKAYA, M.Z. and OGUNMEZ, H., *On the weighted Ostrowski type integral inequality for double integrals*, The Arabian Journal for Science and Engineering (AJSE)-Mathematics, **36** (2011), 1153–1160.
- [18] SARIKAYA, M.Z. and OGUNMEZ, H., *On new inequalities via Riemann-Liouville fractional integration*, Abstract and Applied Analysis, Article ID 428983 (2012), 10 pages.
- [19] SARIKAYA, M.Z., SET, E., YALDIZ, H. and BASAK, N., *Hermite -Hadamard's inequalities for fractional integrals and related fractional inequalities*, Mathematical and Computer Modelling, DOI:10.1016/j.mcm.2011.12.048.

Received July 16, 2012

Accepted September 13, 2014

Düzce University  
Department of Mathematics  
Faculty of Science and Arts  
Düzce, Turkey  
E-mail: sarikayamz@gmail.com  
E-mail: yaldizhatice@gmail.com