

ON GENERALIZATIONS OF SOME CLASSICAL INTEGRAL INEQUALITIES

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Abstract. A unified treatment for generalizations of the midpoint, trapezoid, averaged midpoint-trapezoid and Simpson type inequalities is obtained. Various error bounds for these generalizations are established.

Mathematics subject classification (2010): 26D15.

Keywords and phrases: Midpoint type inequality, trapezoid type inequality, Simpson type inequality, averaged midpoint-trapezoid type inequality, absolutely continuous.

REFERENCES

- [1] N. B. BARNETT, S. S. DRAGOMIR, A. SOFO, *Better bounds for an inequality of the Ostrowski type with applications*, Demonstratio Math. 34 (3) (2001), 533–542.
- [2] P. CERONE AND S. S. DRAGOMIR, *Midpoint type rules from an inequalities point of view*, Handbook of Analytic-Computational Methods in Applied Mathematics, CRC Press N. Y. (2000), 135–200.
- [3] P. CERONE AND S. S. DRAGOMIR, *Trapezoidal type rules from an inequalities point of view*, Handbook of Analytic-Computational Methods in Applied Mathematics, CRC Press N. Y. (2000), 65–134.
- [4] P. CERONE, S. S. DRAGOMIR, J. ROUMELIOTIS, *Some Ostrowski type inequalities for n -time differentiable mappings and applications*, Demonstratio Math. 32 (2) (1999), 697–712.
- [5] S. S. DRAGOMIR, R. P. AGARWAL, P. CERONE, *On Simpson's inequality and applications*, J. Inequal. Appl. 5 (2000), 533–579.
- [6] A. GUESSAB AND G. SCHMEISSER, *Sharp integral inequalities of the Hermite-Hadamard type*, J. Approx. Theory 115 (2002), 260–288.
- [7] Z. LIU, *Refinement of an inequality of Grüss type for Riemann-Stieltjes integral*, Soochow J. Math. 30 (4) (2004), 483–489.
- [8] Z. LIU, *An inequality of Simpson type*, Proc R. Soc. A (2005), 461, 2155–2158.
- [9] Z. LIU, *More on inequalities of Simpson type*, Acta Mathematica Academiae Paedagogicae Nyíregyháziensis 23 (2007), 15–22.
- [10] Z. LIU, *Note on a paper by N. Ujević*, Appl. Math. Lett. 20 (2007), 659–663.
- [11] Z. LIU, *Some Ostrowski-Grüss type inequalities and applications*, Comput. Math. Appl. 53 (2007), 73–79.
- [12] Z. LIU, *A sharp L_2 inequality of Ostrowski type*, ANZIAM J. 49 (2008), 423–429.
- [13] Z. LIU, *Another sharp L_2 inequality of Ostrowski type*, ANZIAM J. 50 (2008), 129–136.
- [14] Z. LIU, *More on the averaged midpoint-trapezoid type rules*, Appl. Math. Comput. 218 (2011), 1389–1398.
- [15] Z. LIU, *Some sharp modified Simpson type inequalities and applications*, Vietnam J. Math. 39: 2 (2011), 135–144.
- [16] M. MATIĆ, J. PEČARIĆ, N. UJEVIĆ, *Improvement and further generalization of inequalities of Ostrowski-Grüss type*, Comput. Math. Appl. 39 (2000), 161–175.
- [17] K. L. TSENG, S. R. HWANG, S. S. DRAGOMIR, *Generalizations of weighted Ostrowski type inequalities for mappings of bounded variation and their applications*, Comput. Math. Appl. 55 (2008), 1785–1793.
- [18] N. UJEVIĆ, *Sharp inequalities of Simpson type and Ostrowski type*, Comput. Math. Appl. 48 (2002), 145–151.