

APPROXIMATE HERMITE—HADAMARD TYPE INEQUALITIES FOR APPROXIMATELY CONVEX FUNCTIONS

JUDIT MAKÓ AND ZSOLT PÁLES

Abstract. In this paper, approximate lower and upper Hermite–Hadamard type inequalities are obtained for functions that are approximately convex with respect to a given Chebyshev system.

Mathematics subject classification (2010): Primary 39B22, 39B12.

Keywords and phrases: convexity, approximate convexity, lower and upper Hermite–Hadamard inequalities.

REFERENCES

- [1] M. BESSENYEI, *Hermite–Hadamard-type inequalities for generalized convex functions*, J. Inequal. Pure Appl. Math. **9**, 3 (2008), Article 63, pp. 51 (electronic).
- [2] M. BESSENYEI AND ZS. PÁLES, *Hadamard-type inequalities for generalized convex functions*, Math. Inequal. Appl. **6**, 3 (2003), 379–392.
- [3] M. BESSENYEI AND ZS. PÁLES, *Characterizations of convexity via Hadamard’s inequality*, Math. Inequal. Appl. **9**, 1 (2006), 53–62.
- [4] S. S. DRAGOMIR AND C. E. M. PEARCE, *Selected Topics on Hermite-Hadamard Inequalities*, RGMIA Monographs (http://rgmia.vu.edu.au/monographs/hermite_hadamard.html), Victoria University, 2000.
- [5] J. HADAMARD, *Étude sur les propriétés des fonctions entières et en particulier d’une fonction considérée par Riemann*, J. Math. Pures Appl. **58** (1893), 171–215.
- [6] A. HÁZY AND ZS. PÁLES, *On a certain stability of the Hermite–Hadamard inequality*, Proc. R. Soc. Lond. Ser. A Math. Phys. Eng. Sci. **465** (2009), 571–583.
- [7] M. KUCZMA, *An Introduction to the Theory of Functional Equations and Inequalities*, volume 489 of Prace Naukowe Uniwersytetu Śląskiego w Katowicach, Państwowe Wydawnictwo Naukowe – Uniwersytet Śląski, Warszawa–Kraków–Katowice, 1985.
- [8] J. MAKÓ AND ZS. PÁLES, *Implications between approximate convexity properties and approximate Hermite–Hadamard inequalities*, Cent. Eur. J. Math., **10**, 3 (2012), 1017–1041.
- [9] J. MAKÓ AND ZS. PÁLES, *On φ -convexity*, Publ. Math. Debrecen. **80**, 1-2 (2012), 107–126.
- [10] D. S. MITRINOVIĆ AND I. B. LACKOVIĆ, *Hermite and convexity*, Aequationes Math. **28** (1985), 229–232.
- [11] C. P. NICULESCU AND L.-E. PERSSON, *Old and new on the Hermite-Hadamard inequality*, Real Anal. Exchange **29**, 2 (2003/04), 663–685.
- [12] C. P. NICULESCU AND L.-E. PERSSON, *Convex Functions and Their Applications*, CMS Books in Mathematics/Ouvrages de Mathématiques de la SMC, 23. Springer-Verlag, New York, 2006. A contemporary approach.
- [13] K. NIKODEM, T. RIEDEL, AND P. K. SAHOO, *The stability problem of the Hermite-Hadamard inequality*, Math. Inequal. Appl. **10**, 2 (2007), 359–363.
- [14] JA. TABOR AND JÓ. TABOR, *Generalized approximate midconvexity*, Control Cybernet. **38**, 3 (2009), 655–669.
- [15] JA. TABOR, JÓ. TABOR, AND M. ŻOŁDAK, *Optimality estimations for approximately midconvex functions*, Aequationes Math. **80** (2010), 227–237.