Mathematical Inequalities & Applications
Volume 22, Number 1 (2019), 261–274
doi:10.7153/mia-2019-22-20

POLYNOMIAL INEQUALITIES IN L^p NORMS WITH GENERALIZED JACOBI WEIGHTS

LEOKADIA BIALAS-CIEZ AND GRZEGORZ SROKA

Abstract. We give concrete estimates of Schur- and Nikolskii-type inequalities with the best exponent of polynomial degree in L^p norms with generalized Jacobi weights. In particular, we obtain these inequalities with the Chebyshev weight, with the Gegenbauer weights and with the classical Jacobi ones.

Mathematics subject classification (2010): 41A17, 35A23.
Keywords and phrases: Schur inequality, Nikolskii inequality, Jacobi weight, Gegenbauer weight, Chebyshev weight.

REFERENCES

[1] L. BIALAS-CIEZ, *Equivalence of Markov's and Schur's inequalities on compact subsets of the complex plane*, J. Inequal. Appl. **3** (1999), 45–49.
[2] P. BORWEIN, T. ERDÉLYI, *Polynomials and Polynomial Inequalities*, Graduate Texts in Mathematics, Springer-Verlag 1995.
[3] I. K. DAUGAVET, S. Z. RAFALSON, *Some inequalities of Markov-Nikol'skii type for algebraic polynomials*, Vestnik Leningrad. Univ. Mat. Mekh. Astronom. **1** (1972), 15–25 (in Russian).
[4] R. A. DE VORE, G. G. LORENTZ, *Constructive Approximation*, Springer-Verlag 1993.
[5] T. ERDÉLYI, J. SZABADOS, *On polynomials with positive coefficients*, J. Approx. Theory **54** (1988), 107–122.
[6] P. GOETGHELUCK, *Two polynomial division inequalities in L^p*, J. Inequal. Appl. **2** (1998), 285–296.
[7] P. GOETGHELUCK, *On the problem of sharp exponents in multivariate Nikolskii-type inequalities*, J. Approx. Theory **77** (1994), 167–178.
[8] P. GOETGHELUCK, *On the Markov inequality in L^p-spaces*, J. Approx. Theory **62** (1990), 197–205.
[9] P. GOETGHELUCK, *Polynomial inequalities and Markov's inequality in weighted L^p-spaces*, Acta Math. Acad. Sci. Hung. **33** (1979), 325–331.
[10] L. HÖRMANDER, *Notions of Convexity*, Birkhäuser, Basel-Boston-Berlin, 1994.
[11] S. V. KONJAGIN, *Estimation of the derivatives of polynomials*, Dokl. Akad. Nauk SSSR **243** (1978), 1116–1128 (in Russian).
[12] A. LUPAŞ, *An inequality for polynomials*, Univ. Beograd. Publ. Elektrotehn. Fak. Ser. Mat. Fiz. **461–497** (1974), 241–255.
[13] G. MASTROIANNI, *Some weighted polynomial inequalities*, J. Comput. Appl. Math. **65** (1995), 279–292.
[14] G. MASTROIANNI, V. TOTIK, *Weighted polynomial inequalities with doubling and A_∞ weights*, Constr. Approx. **16** (2000), 37–71.
[15] G. V. MILOVANOVIĆ, D. S. MITRINOVIĆ, TH. M. RASSIAS, *Topics in Polynomials: Extremal Problems, Inequalities, Zeros*, World Scientific Publ., Singapore, 1994.
[16] Q. I. RAHMAN, G. SCHMEISSER, *Analytic Theory of Polynomials*, London Math. Soc. Monogr., Oxford Univ. Press 2002, vol. 26.
[17] I. E. SIMONOV, P. YU. GLAZYRINA, *Sharp Markov-Nikol'skii inequality with respect to the uniform norm and the integral norm with Chebyshev weight*, J. Approx. Theory, **192** (2015), 69–81.

Paper MIA-22-20