

SOME INEQUALITIES FOR COSINE SUMS

STAMATIS KOUMANDOS

Abstract. We establish sharp lower and upper estimates for the cosine sums $\sum_{k=1}^n \frac{\cos k\theta}{k+1}$. We also discuss the possibility of extending these results to other cosine sums of this type.

Mathematics subject classification (2000): 42A05, 42A32.

Key words and phrases: Cosine sums, Fourier series.

REFERENCES

- [1] A. S. BELOV, Examples of trigonometric series with nonnegative partial sums. (Russian) *Math. Sb.* **186** no 4, (1995), 21–46; (English translation) **186**, no 4, (1995), 485–510.
- [2] G. BROWN AND E. HEWITT, A class of positive trigonometric sums, *Math. Ann.* **268** (1984), 91–122.
- [3] G. BROWN AND S. KOUMANDOS, On a monotonic trigonometric sum, *Monatsh. für Math.* **123** (1997), 109–119.
- [4] G. GASPER, Nonnegative sums of cosine, ultraspherical and Jacobi polynomials, *J. Math. Anal. Appl.* **26** (1969), 60–68.
- [5] C. HYLÉN-CAVALLIUS, Geometrical methods applied to trigonometrical sums. *Kungl. Fysiografiska Sällskapets i Lund Förhandlingar* **21** (1950), 1–19.
- [6] G. V. MILOVANOVIĆ, D. S. MITRINOVIĆ AND TH. M. RASSIAS, *Topics in polynomials. Extremal problems, inequalities, zeros.* World Scientific, 1994.
- [7] A. P. PRUDNIKOV, YU. A. BRYCHKOV AND O. I. MARICHEV, *Integrals and Series*, Gordon Breech Science Publishers, 1990.
- [8] W. ROGOSINSKI AND G. SZEGŐ, Über die Abschnitte von Potenzreihen die in einem Kreise beschränkt bleiben. *Math. Zeit.* **28** (1928), 73–94.
- [9] M. TOMIĆ, On Fejér's polynomials, *Glas Srpske AN* **232** (1958), 29–44.
- [10] W. H. YOUNG, On certain series of Fourier. *Proc. London Math. Soc.* (2) **11** (1912), 357–366.