

OPPENHEIM'S PROBLEM AND RELATED INEQUALITIES FOR DUNKL KERNELS

FREJ CHOUCHENE

Abstract. In this paper, we establish some inequalities related to Oppenheim's problem for Dunkl kernels. In order to prove our main results, we present new inequalities involving modified Bessel functions of the first kind. Refinements of inequalities for modified Bessel functions are also given.

Mathematics subject classification (2010): 26D07, 33B10, 33C10.

Keywords and phrases: Oppenheim's problem, Bessel functions, modified Bessel functions, Dunkl kernels.

REFERENCES

- [1] Á. BARICZ, *Functional inequalities involving Bessel and modified Bessel functions of the first kind*, *Expo. Math.* **26** (3) (2008), 279–293.
- [2] Á. BARICZ, *Generalized Bessel functions of the first kind*, Lecture Notes in Mathematics, 1994. Springer-Verlag, Berlin, 2010. xiv+206 pp.
- [3] Á. BARICZ AND L. ZHU, *Extension of Oppenheim's problem to Bessel functions*, *J. Inequal. Appl.*, (2007), Art. ID 82038, 7 pp.
- [4] C. CHETTAOUI AND K. TRIMÈCHE, *New type Paley-Wiener theorems for the Dunkl transform on \mathbb{R}* , *Integral Transforms Spec. Funct.* **14** (2) (2003), 97–115.
- [5] C. F. DUNKL, *Differential-difference operators associated to reflection groups*, *Trans. Amer. Math. Soc.* **311** (1) (1989), 167–183.
- [6] C. F. DUNKL, *Integral kernels with reflection group invariance*, *Canad. J. Math.* **43** (1991), 1213–1227.
- [7] C. F. DUNKL, *Hankel transforms associated to finite reflection groups*, *Contemp. Math.* **138** (1992), 123–138.
- [8] C. F. DUNKL, *Intertwining operators and polynomials associated with the symmetric group*, *Monatsh. Math.* **126** (1998), 181–209.
- [9] C. F. DUNKL, *Orthogonal polynomials of types A and B and related Calogero models*, *Comm. Math. Phys.* **197** (1998), 451–487.
- [10] M. A. MOUROU, *Transmutation operators associated with a Dunkl type differential-difference operator on the real line and certain of their applications*, *Integral Transforms Spec. Funct.* **12** (1) (2001), 77–88.
- [11] M. A. MOUROU AND K. TRIMÈCHE, *Opérateurs de transmutation et théorème de Paley-Wiener associés à un opérateur aux dérivées et différences sur \mathbb{R}* , *C. R. Acad. Sci. Paris, Série I Math.* **332** (2001), 397–400.
- [12] M. A. MOUROU AND K. TRIMÈCHE, *Transmutation operators and Paley-Wiener theorem associated with a differential-difference operator on the real line*, *Anal. Appl.* **1** (2003), 43–70.
- [13] M. RÖSLER, *Bessel-type signed hypergroups on \mathbb{R}* , In: H. Heyer, A. Mukherjea (eds.), *Probability measures on groups and related structures XI*. Proceedings, Oberwolfach 1994, Singapore: World Scientific, (1995), 292–304.
- [14] G. N. WATSON, *A treatise on the theory of Bessel functions*, Cambridge University Press, Cambridge, UK, 1962.
- [15] L. ZHU, *A solution of a problem of Oppenheim*, *Math. Inequal. Appl.* **10** (1) (2007), 57–61.