AN EXTENSION OF THE SIDON–FOMIN TYPE INEQUALITY AND ITS APPLICATIONS

ŽIVORAD TOMOVSKI

Abstract. An extension of the Sidon-Fomin type inequality [5] is made by considering the \( r \)-th derivative of the Dirichlet’s kernel \( D_k^{(r)} \) instead of \( D_k \). Namely, two different proofs of the following inequality

\[
\pi \int_0^\pi \left| \sum_{k=0}^n \alpha_k D_k^{(r)}(x) \right| dx = O \left( (n+1)^{r+1} \right), \quad |\alpha_k| \leq 1 \quad \text{for all} \quad k
\]

are given. Applying the inequality (\( * \)) it’s shown that the new class \( S_r \) is a subclass of \( BV \cap C_r \), \( r = 0, 1, 2, \ldots \) where \( C_r \) is the extension of the Garret-Stanojević class [7] and \( BV \) is the class of null sequences of bounded variation. Also, in this paper an extension of the theorem for convergence and integrability for cosine series of a [6] is made by considering the class \( S_r \), \( r = 0, 1, 2, \ldots \) instead of \( S \).


Key words and phrases: Sidon-Fomin’s inequality, Garret-Stanojević class, Bernstein’s inequality, embedding relation.

REFERENCES