

Year: 2022

Vol.: 101

Fasc.: 3-4

**Title:** A lower bound for restricted exponential sums

**Author(s):** Mikhail Komarov

Let  $M(f; r) = \max_{|z|=r} |f(z)|$ . Define  $\mathcal{F}_n, \mathcal{G}_n$  to be the classes of exponential sums of the form  $\sum_{k=1}^n \lambda_k e^{\lambda_k z}$  and  $\sum_{k=1}^n e^{\lambda_k z}$ , respectively, with  $|\lambda_1| = \dots = |\lambda_n| = 1$ . For  $r \in (0, \frac{1}{2})$ , we prove that  $\inf_{f \in \mathcal{F}_n} M(f; r) \asymp nr^{n-1}/(n-1)!$ , and establish the Turán–Govil type bound  $\inf_{g \in \mathcal{G}_n} M(g'; r)/M(g; r) \asymp r^{n-1}/(n-1)!$ . Approximations of entire functions of exponential type  $\sigma \leq 1$  on compact sets  $K \subset \mathbb{C}$  by sums  $f_n \in \mathcal{F}_n$ , as well as representations of harmonics of a trigonometric polynomial  $T_n(t)$  in the form of sums of its translations,  $T_n(t - t_k)$ , are also considered. In particular, we obtain a new Fejér type estimate for the leading harmonic  $\tau_{2n}(t)$  of nonnegative polynomials  $T_{2n}(t)$  of even degree  $2n$ .

**Address:**

Mikhail Komarov  
Department of Functional Analysis  
and Its Applications  
Vladimir State University  
600000 Vladimir  
Gor'kogo str. 87  
Russia