

L^p bounds for orthogonal polynomials and applications

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The classical Steklov problem deals with bounds of the Tchebyshëv norm $\|p_n\|^\infty$ for the polynomials $p_n(x)$, orthonormal on the interval Δ with respect to the strictly positive weight function: $w \in L^1(\Delta) \cap S_\delta$, $S_\delta := \{w : w(x) \geq \delta > 0, x \in \Delta\}$. Modern applications (in particular, to the information entropy of quantum systems) motivate us to consider also the estimates of L^p norms: $\|p_n\|_w^p(\Delta)$ for the Steklov weight functions $w \in X(\Delta) \cap S_\delta$ from the various classes $X := L^\infty$, S — (the Szego class), BMO , A_p — (the Muckenhoupt class).

Our talk is based on the joint paper with Sergey Denisov and Michel Alexis [1]. Thus, we focus on $\|p_n\|_w^p$, $p > 2$, for $w \in A_2 \cap S_\delta$.

References

- [1] M. Alexis, A. Aptekarev and S. Denisov, Continuity of Weighted Operators, Muckenhoupt A_p Weights, and Steklov Problem for Orthogonal Polynomials, *Int. Math. Res. Not.* **2022** (8), 5935–5972.