

Derivative estimates for solutions of the (α, β) -Poisson equation

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Abstract. We obtain Schwarz–Pick type inequalities for solutions of the (α, β) -Poisson equation $L_{\alpha, \beta} u = g$, where the function g is given on the unit disc \mathbb{D} and α and β are complex parameters satisfying $\Re \alpha + \Re \beta > -1$. In particular, for $g = 0$, we prove sharp estimate for the $Du(0)$ for (α, β) -harmonic functions u in terms of L^p norm of the boundary function and asymptotically sharp estimate of $\|Du(z)\|$. The obtained results provide a significant improvement over previous research on the subject. This is work in progress.

Keywords: (α, β) -harmonic function; (α, β) -Poisson equation; Schwarz lemma; Weighted Green function.

References

- [1] **M. Arsenović, J. Gajić.** Schwarz–Pick Lemma for (α, β) -harmonic functions in the unit disc, *Journal of Mathematical Analysis and Applications*, 2024, <https://doi.org/10.1016/j.jmaa.2024.128489>.
- [2] **M. Li, X. Chen.** Schwarz Lemma for Solutions of the α -harmonic Equation. *Bulletin of the Malaysian Mathematical Sciences Society*, 2022, 45, 2691–2713.
- [3] **A. Khalfallah, M. Mhamdi.** Schwarz Type Lemmas for Generalized Harmonic Functions. *Bulletin of the Malaysian Mathematical Sciences Society* 2024, 47(53).