# On Bernstein- and Marcinkiewicz-type inequalities on multivariate $C^\alpha$-domains

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We prove new Bernstein and Markov type inequalities in $L^p, 1 \le p < \infty$ spaces associated with the normal and the tangential derivatives on the boundary of a general compact $C^\alpha$-domain with $1 \le \alpha \le 2$. These estimates are also applied to establish Marcinkiewicz type inequalities for discretization of $L^p$ norms of algebraic polynomials on $C^\alpha$-domains with asymptotically optimal number of function samples used. This extends $L^p$ tangential Bernstein type and Marcinkiewicz type inequalities given in [1] on a general compact $C^2$ domain. In case when $p = \infty$ similar Bernstein type inequalities and asymptotically optimal discretization meshes on $C^\alpha$-domains were given earlier in [2].

# References

[1] F. Dai, A. Prymak, *$L^p$-Bernstein inequalities on $C^2$-domains and applications to discretization*, Trans. Amer. Math. Soc., 375 (2022), pp. 1933–1976.

[2] A. Kroó, *Bernstein type inequalities on star–like domains in $\mathbb{R}^d$ with application to norming sets*, Bull. Math. Sci., 3 (2013), pp. 349-361.