

A PÓLYA–SZEGŐ-TYPE INEQUALITY FOR CONVEX FUNCTIONS

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(Joint work with Jacopo Ulivelli)

The classical Pólya–Szegő inequality can be seen as a far-reaching functional analog of the Euclidean isoperimetric inequality. Several generalizations are known, among which we want to highlight a recent version by Bianchi, Cianchi, and Gronchi [1] that considers simultaneous symmetrization of both the Sobolev function and the Young function.

We present a new Pólya–Szegő-type inequality for convex functions which coincides with the inequality of Bianchi, Cianchi, and Gronchi in special cases. Our approach builds upon a previous strategy of Klartag [2] and connects mixed volumes of higher-dimensional convex bodies with mixed Monge–Ampère measures of convex functions.

References

- [1] G. BIANCHI, A. CIANCHI, AND P. GRONCHI, *Anisotropic symmetrization, convex bodies, and isoperimetric inequalities*. Adv. Math. **462** (2025), Art. 110085.
- [2] B. KLARTAG, *Marginals of geometric inequalities*. In *Geometric Aspects of Functional Analysis: Israel Seminar 2004–2005*, pp. 133–166, Springer, Berlin, 2007.