# ON THE BOHNENBLUST–HILLE INEQUALITY

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The multilinear Bohnenblust–Hille inequality asserts that for each positive integer $m$ there is a constant $C_m \geq 1$ such that

$$\left( \sum_{i_1,...,i_m=1}^{N} \left| T(e_{i_1}, ..., e_{i_m}) \right|^{\frac{2m}{m+1}} \right)^{\frac{m+1}{2m}} \leq C_m \left\| T \right\|,$$

for all positive integers $N$ and all $m$-linear forms $T$ defined on $\ell_\infty^N \times \cdots \times \ell_\infty^N$. This inequality was rediscovered recently and now it is known that the precise information on the growth of its constants plays an important role in different fields of Mathematics and Physics. We will present recent results on the estimates for the constants $C_m$ for real and complex scalars. We show that, in contrast with the predictions from the last 80 years, these constants have, at least, a subpolynomial growth.

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## References

[1] D. Diniz, G.A. Muñoz-Fernández, D. Pellegrino, J.B. Seoane-Sepúlveda, *The asymptotic growth of the constants in the Bohnenblust-Hille inequality is optimal*, J. Funct. Anal. **263** (2012), no. 2, 415–428.

[2] D. Nuñez-Alarcón, D. Pellegrino, J.B. Seoane-Sepúlveda, *On the Bohnenblust-Hille inequality and a variant of Littlewood's 4/3 inequality*, J. Funct. Anal. **264** (2013), no. 1, 326–336.

[3] D. Nuñez-Alarcón, D. Pellegrino, J.B. Seoane-Sepúlveda, D.M. Serrano-Rodríguez, *There exist multilinear Bohnenblust-Hille constants* $(C_n)_{n=1}^{\infty}$ *with* $\lim_{n\to\infty}(C_{n+1} - C_n) = 0$, J. Funct. Anal. **264** (2013), no. 2, 429–463.

[4] D. Pellegrino, J.B. Seoane-Sepúlveda, *New upper bounds for the constants in the Bohnenblust-Hille inequality*, J. Math. Anal. Appl. **386** (2012), 300–307.

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