

Multiplicative inequalities on BMO

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We will talk about the so-called multiplicative inequality for BMO functions:

$$\|\varphi\|_{L^r}^r \leq C_{p,r} \|\varphi\|_{L^p}^p \|\varphi\|_{BMO}^{r-p},$$

where $1 < p < r < \infty$. We will discuss how to find sharp constants in this inequality for the case of quadratic norm on BMO space based on a segment, circle or a real line. Talking about cases of segment and circle we assume the average of φ to be equal to zero. Also, we prove this inequality with dimension-free constant for the Garsia-type norm on BMO. The talk is based on joint work with D. Stolyarov, V. Vasyunin and I. Zlotnikov.