

Extremal problems and monotone rearrangement on averaging classes

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We will discuss integral extremal problems on the so-called averaging classes of functions, meaning classes defined in terms of averages of their elements, such as BMO, VMO, and Muckenhoupt weights. A typical extremal problem we consider involves an integral inequality, such as the John–Nirenberg inequality for BMO. One common way to formulate such questions is using Bellman functions. It turns out that such Bellman functions are solutions to specific boundary value problems, formulated in terms of convex geometry. We will also discuss the monotone rearrangement operator acting on the averaging classes, which arises naturally in this context and is useful when solving extremal problems.

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