

## OPTIMAL BOUNDS FOR LINEAR FUNCTIONALS ON MONOTONE FUNCTIONS

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*Abstract.* We determine optimal bounds on linear functionals over the space of square integrable functions on a finite interval, restricted to the nondecreasing elements of the subspace orthogonal to constants. We discuss conditions of bounds attainability and present exemplary applications.

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### REFERENCES

- [1] H. A. DAVID, H. N. NAGARAJA, *Order Statistics*, 3rd Ed., Wiley, Hoboken, NJ, 2003.
- [2] N. DUNFORD, J. T. SCHWARZ, *Linear Operators I*, Wiley, New York, 1958.
- [3] A. GORONCY, T. RYCHLIK, *How deviant can you be? The complete solution*, *Math. Inequal. Appl.*, **9**, (4) (2006), 633–647.
- [4] U. KAMPS, *A Concept of Generalized Order Statistics*, Teubner, Stuttgart, 1995.
- [5] A. W. MARSHALL, I. OLKIN, *Inequalities: Theory of Majorization and Its Applications*, Academic Press, New York, 1979.
- [6] D. S. MITRINOVIĆ, *Analytic Inequalities*, Springer-Verlag, Berlin, 1970.
- [7] S. MORIGUTI, *A modification of Schwarz's inequality, with applications to distributions*, *Ann. Math. Statist.*, **24**, (1953), 107–113.
- [8] T. RYCHLIK, *Sharp inequalities for linear combinations of elements of monotone sequences*, *Bull. Polish Acad. Sci. Math.*, **40**, (1992), 247–254.
- [9] T. RYCHLIK, *Projecting Statistical Functionals*, *Lecture Notes in Statist.*, **160**, Springer, New York, 2001.