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**ZEEV DITZIAN**, University of Alberta

*Measure of smoothness on the unit ball*

The classic measure of smoothness of functions on a domain  $D$  with respect to a norm as applied to the unit ball is not “correct” that is, it does not satisfy matching direct (Jackson) and weak converse inequalities with respect to algebraic polynomial approximation. To deal with the above deficiency F. Dai and Y. Xu introduced a “correct” measure of smoothness on  $L_p(B)$ .

Here I am introducing a new different measure of smoothness of functions on the unit ball  $B$ . This measure beside being “correct” has the added advantages of being rotation invariant (independent of the basis of  $R^d$ ), being applicable to more norms, and being amenable to more applications. Computability of the new measure was demonstrated and some of the computations show optimality of results.