

BMO AND EXPONENTIAL ORLICZ SPACE ESTIMATE OF THE DISCREPANCY FUNCTION IN  
ARBITRARY DIMENSION

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We generalize the results of Bilyk et al. on discrepancy in spaces with bounded mean oscillation and in exponential Orlicz spaces to arbitrary dimension. In particular, we use dyadic harmonic analysis to prove upper bounds of the BMO and exponential Orlicz space norms of the discrepancy function for the so-called order 2 digital nets. Such estimates play an important role as an intermediate step between the well-understood  $L_p$  bounds and the still elusive  $L_\infty$  asymptotics of the discrepancy function in arbitrary dimensions.

*Joint work with Dmitriy Bilyk (University of Minnesota, USA).*