Random star discrepancy based on stratified sampling

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In this talk, we consider the estimation of the expected star discrepancy. First, the expected star discrepancy upper bound is obtained for the jittered sampling. This improves the upper bound derived in B. Doerr(Math. Comp. **91**(2022) 1871-1892). Second, the strong partition principle of the star discrepancy version is obtained, which proves that the expected star discrepancy of stratified sampling is smaller than that of simple random sampling for any equal-measure partition. This partially solves open question 2 in M. Kiderlen and F. Pausinger(J. Complexity **70**(2022) 101616). In the end, we consider the estimation of the weighted star discrepancy. A better weighted probabilistic star discrepancy bound than the use of plain Monte Carlo point sets is provided in terms of convergence order, i.e., the convergence order of the weighted probabilistic bound is improved from $O(N^{-\frac{1}{2}})$ to $O(N^{-\frac{1}{2}-\frac{1}{2d}} \cdot \ln^{\frac{1}{2}} N)$.

[1] B. Doerr, A sharp discrepancy bound for jittered sampling, *Math. Comp.*, 91(2022), 1871-1892.

[2] M. Kiderlen and F. Pausinger, On a partition with a lower expected L_2-discrepancy than classical jittered sampling, *J. Complexity* 70(2022), 101616.

[3] C. Aistleitner, Tractability results for the weighted star-discrepancy, *J. Complexity.*, 30(2014), 381-391.