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Roswitha Hofer¹

Abstract

In this paper we investigate a special sequence related to the Halton sequence, namely the Halton sequence indexed by $\lfloor n\beta \rfloor$ with $\beta \in \mathbb{R}$, and prove a metric almost low-discrepancy result.

Keywords: Halton sequences, Subsequences, Discrepancy.

2000 MSC: 11K31, 11K38.

1. Introduction

The *discrepancy* of the first N terms of any sequence $(z_n)_{n \geq 0}$ of points in $[0, 1]^s$ is defined by

$$D_N(z_n) = \sup_J \left| \frac{A_N(J)}{N} - \lambda_s(J) \right|,$$

where the supremum is extended over all half-open subintervals J of $[0, 1]^s$, λ_s denotes the s -dimensional Lebesgue measure, and the counting function $A_N(J)$ is given by

$$A_N(J) = \#\{0 \leq n \leq N - 1 : z_n \in J\}.$$

For the sake of simplicity, we will sometimes write D_N instead of $D_N(z_n)$. If the supremum is extended over all half-open subintervals J of $[0, 1]^s$ with the lower left point in the origin then we arrive at the notion of the *star discrepancy* D_N^* . It is not so hard to see that $D_N^* \leq D_N \leq 2^s D_N^*$. A sequence $(z_n)_{n \geq 0}$ of points in $[0, 1]^s$ is called uniformly distributed if $\lim_{N \rightarrow \infty} D_N = 0$. (We refer the interested reader to (5) for a detailed background on the theory of uniform distribution.)

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