On existence and discrepancy of certain Niederreiter-Halton sequences

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Well known constructions of s-dimensional low-discrepancy sequences are for example the concept of Halton sequences in pairwise coprime bases $q_1, \ldots, q_s$ and the concept of digital $(\mathbf{T}, s)$-sequences over Z_q with q a prime. Both can be interpreted as an s-dimensional generalization of the one-dimensional van der Corput sequence. The so called "Niederreiter-Halton sequences" represent hybrids of both, since they are built by juxtaposing v different digital $(\mathbf{T}^{(1)}, w_l)$-sequences over Z_{q_l} where $q_1, \ldots, q_v$ are different primes and $w_1, \ldots, w_v$ are positive integers.

It was shown that a Niederreiter-Halton sequence is uniformly distributed in $[0, 1)^s$ (with $s = w_1 + \cdots + w_v$) if and only if each of the juxtaposed digital $(\mathbf{T}^{(1)}, w_l)$-sequences over Z_{q_l} is uniformly distributed.

In this talk we consider the discrepancy of Niederreiter-Halton sequences, more exactly, we study very special examples in order to gain a more qualitative insight into this class of sequences. Thereby a special subclass, the so called "finite row Niederreiter-Halton sequences", arouses interest. We talk about existence and precise construction principles of certain finite row Niederreiter-Halton sequences.