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A Study of Quasi-Monte Carlo Methods Via Dependence Concepts

Quasi-Monte Carlo methods are multidimensional numerical integration methods that often provide more accurate estimators than the naive Monte Carlo method. The constructions underpinning these methods are designed to provide a form of structured sampling that can exploit certain characteristics of the integrand under study. These methods are typically studied using function decompositions, for example based on Fourier, Walsh or Haar series. In this talk, we propose an alternative way of studying these methods based on dependence concepts such as those introduced by Lehmann in 1966. This allows us to gain some new insight on these methods.