Some Recent Advances on Quaternary-Code Designs

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Abstract

In the recent past, there was a realization that nonregular designs could be utilized in conducting efficient experiments with flexibility, run size economy, and ability to exploit interactions. This led to a growing research on developing a general construction methodology of nonregular designs with good properties. Recent research indicates that designs constructed from quaternary codes (QC) are very promising. This talk can be briefly divided into three parts. The first part introduces the basics of nonregular designs and compares them to the commonly used regular designs in some real-life experiments. The second part provides an introduction on the methodology and supplementary techniques on how quaternary codes can be used from constructing designs. Optimal QC designs under maximum resolution, minimum aberration and maximum projectivity criteria are compared to the comparable minimum aberration regular designs. The last part of this talk provides some recent refinements on the theory and optimization of quaternary-code designs, which leads to some cost-efficient optimal designs with better design properties.