

Q_B -optimal saturated two-level main effects designs

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It is shown that the Q_B -criterion which aims to improve the estimation in as many models as possible by incorporating experimenters' prior knowledge along with an approximation to the A_S criterion is useful for the selection of multifactor factorial designs under model uncertainty, and it has a better statistical interpretation than many standard criteria (Tsai and Gilmour, 2012). In this talk we apply this criterion for the study of saturated two-level main effects designs. These saturated main effects designs allow a very large number of factors to be screened, so that those with the most important effects on the responses of interest can be identified. We show that under the sets of priors with more weights on models of small size, p -efficient designs should be recommended; when models with more parameters are of interest, D -optimal designs would be better. Also, we present new class of saturated designs which can be found between these two designs under different sets of priors. The way in which the choice of designs depends on experimenters' prior beliefs will be demonstrated for the cases when $N = 2 \bmod 4$. Some construction will also be discussed.