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Optimum Mixture Designs under Random Regression Coefficients

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Abstract

In a mixture experiment the mean response is assumed to depend only on the relative proportion of ingredients or components present in the mixture. Scheffe (1958, 1963) first systematically considered this problem and introduced different models, with fixed regression coefficients, and designs suitable for estimation of the parameters. Problems related to optimal estimation of parameters in random coefficient regression model have been initiated by Liski *et al.* (1996). A comprehensive review can be found in Liski et al (2002). In this paper, we consider linear and quadratic mixture models with random regression coefficients, and attempt to find the A- and D- optimal designs for estimation of the regression coefficients in the mean model.

Keywords: Mixture experiments, second order models, random regression coefficients, A-optimality criterion, D-optimality criterion, equivalence theorem.

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