D-optimal designs for binary response models in mixture experiments

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Abstract

In this work, *D*-optimal designs for binary response models in mixture experiments are discussed. This kind of model setting occurs in many chemical and industrial experiments. Under the linear logit link, *D*-optimal designs for binary response models with two explanatory variables on the first quadrant of R^2 as the design space have been investigated by Sitter and Torsney (1995). In this work, we first provide an approach to obtain an essentially complete class of designs with reduced number of optimal supports, then the special feature of the *D*-optimal designs obtained there are illustrated with more insights on the structure. It is helpful for the search of *D*-optimal designs on other design spaces with more restrictions. Later under the design space with constraints due to the mixture restriction, we obtain the *D*-optimal designs for binary response models under the linear logit link in a mixture design space.

Keywords: Essentially complete class of designs, reduced number of optimal supports, restricted design space