# Optimal designs for total effects

**R. A. Bailey[1] and Pierre Druilhet[2]**

[2]*Queen Mary College, University of London , UK*
[2]*CREST-ENSAI, Campus de Ker Lann, Bruz, France*

## Abstract

We study optimality of circular neighbour-balanced block designs when neighbour effects are present in the model. In the literature, many optimality results are established for direct effects and neighbour effects separately, but few for total effects, that is, the sum of direct effect of treatment and relevant neighbour effects. We show that circular neighbour-balanced designs are universally optimal for total effects among designs with no self neighbour. Then, we use some adaptations of the methods developed by Kunert and Martin (2002) to derive efficiency factors of these designs, and show some situations where a design with self neighbours is preferable to a neighbour-balanced design.

## Keywords

Neighbour designs, cross-over design, universal optimality, total effects.

## References:

Kunert, J. and Martin, R. J. (2000). On the determination of optimal designs for an interference model. *Ann. Stat.* pp. 1728–1742.