

Goos, Peter

Optimal versus orthogonal and equivalent-estimation design of blocked and split-plot experiments. (English) [Zbl 1108.62073](#)

Stat. Neerl. 60, No. 3, 361-378 (2006).

Summary: This article provides an overview of the recent literature on the design of blocked and split-plot experiments with quantitative experimental variables. A detailed literature study introduces the ongoing debate between an optimal design approach to constructing blocked and split-plot designs and approaches where the equivalence of ordinary least squares and generalized least squares estimates are envisaged. Examples where the competing design strategies lead to totally different designs are given, as well as examples in which the optimal experimental designs are orthogonally blocked or equivalent-estimation split-plot designs.

MSC:

[62K05](#) Optimal statistical designs

[62K10](#) Statistical block designs

Cited in **8** Documents

Keywords:

equivalence of OLS and GLS; ordinary least squares; generalized least squares; orthogonal blocking; D-optimal design

Full Text: [DOI](#)

References:

- [1] Anbari F. T., ASQC Technical Conference Transactions pp 852– (1994)
- [2] DOI: 10.2307/2336117 · doi:10.2307/2336117
- [3] DOI: 10.1214/aos/1017938924 · Zbl 0957.62065 · doi:10.1214/aos/1017938924
- [4] DOI: 10.2307/1270995 · doi:10.2307/1270995
- [5] Bingham D. R., Journal of Quality Technology 33 pp 2– (2001)
- [6] DOI: 10.1046/j.1467-9876.2003.05029.x · Zbl 1111.62316 · doi:10.1046/j.1467-9876.2003.05029.x
- [7] Box G. E. P., Annals of Mathematical Statistics 28 pp 195– (1957)
- [8] Cook R. D., Technometrics 31 pp 339– (1989)
- [9] Donev A. N., Journal of the Royal Statistical Society Series B 51 pp 297– (1989)
- [10] Draper N. R., Journal of Statistics 40 pp 487– (1998)
- [11] S. G. Gilmour, and P. Goos(2006), Bayesian analysis of data from multi-stratum response surface designs , Bayesian analysis of data from multi-stratum response surface designs , Faculty of Applied Economics, Universiteit Antwerpen.
- [12] Gilmour S. G., Communications in Statistics: Theory and Methods 29 pp 2157– (2000)
- [13] Goos P., The optimal design of blocked and split-plot experiments (2002) · Zbl 1008.62068 · doi:10.1007/978-1-4613-0051-9
- [14] P. Goos, and A. N. Donev(2006), Blocking response surface designs, to appear in Computational Statistics and Data Analysis . . Zbl 1157.62471
- [15] P. Goos, and A. N. Donev(2006), The D-optimal design of blocked experiments with mixture components, to appear in Journal of Quality Technology .
- [16] P. Goos, and A. N. Donev(2006), D-optimal minimum support mixture designs in blocks, to appear in Metrika . . Zbl 1105.62076
- [17] P. Goos, and A. N. Donev(2006), Tailor-made split-plot mixture-process variable designs, Unpublished manuscript.
- [18] DOI: 10.1016/S0167-9473(01)00010-X · Zbl 1079.62532 · doi:10.1016/S0167-9473(01)00010-X
- [19] Goos P., Journal of Quality Technology 33 pp 436– (2001)
- [20] DOI: 10.1198/004017003000000050 · doi:10.1198/004017003000000050
- [21] DOI: 10.1081/STA-120028731 · Zbl 1066.62076 · doi:10.1081/STA-120028731
- [22] Goos P., Journal of Quality Technology 36 pp 12– (2004)

- [23] DOI: [10.1016/j.spl.2003.07.003](https://doi.org/10.1016/j.spl.2003.07.003) · Zbl [1116.62371](https://zbmath.org/?q=ser/1116.62371) · doi:[10.1016/j.spl.2003.07.003](https://doi.org/10.1016/j.spl.2003.07.003)
- [24] DOI: [10.2307/1270532](https://doi.org/10.2307/1270532) · Zbl [1064.62552](https://zbmath.org/?q=ser/1064.62552) · doi:[10.2307/1270532](https://doi.org/10.2307/1270532)
- [25] John P. W. M., Technical Report 8 (1984)
- [26] DOI: [10.2307/1269549](https://doi.org/10.2307/1269549) · Zbl [0850.62618](https://zbmath.org/?q=ser/0850.62618) · doi:[10.2307/1269549](https://doi.org/10.2307/1269549)
- [27] DOI: [10.1198/004017002753398344](https://doi.org/10.1198/004017002753398344) · doi:[10.1198/004017002753398344](https://doi.org/10.1198/004017002753398344)
- [28] Letsinger J. D., *Journal of Quality Technology* 28 pp 381– (1996)
- [29] R. Mee(2006), Optimal three-level designs for response surfaces in spherical experimental regions, Unpublished manuscript.
- [30] Nigam A. K., *Annals of Statistics* 47 pp 1294– (1976)
- [31] P. A. Parker, S. M. Kowalski, and G. G. Vining(2006), Construction of balanced equivalent estimation second-order split-plot designs, Unpublished manuscript.
- [32] P. A. Parker, S. M. Kowalski, and G. G. Vining(2006), Unbalanced and minimal point equivalent estimation second-order split-plot designs, Unpublished manuscript.
- [33] Prescott P., *Communications in Statistics: Theory and Methods* 29 pp 2229– (2000)
- [34] DOI: [10.1016/S0167-9473\(99\)00033-X](https://doi.org/10.1016/S0167-9473(99)00033-X) · Zbl [1061.62551](https://zbmath.org/?q=ser/1061.62551) · doi:[10.1016/S0167-9473\(99\)00033-X](https://doi.org/10.1016/S0167-9473(99)00033-X)
- [35] DOI: [10.1198/00401700152404291](https://doi.org/10.1198/00401700152404291) · Zbl [1072.62623](https://zbmath.org/?q=ser/1072.62623) · doi:[10.1198/00401700152404291](https://doi.org/10.1198/00401700152404291)
- [36] Vining G. G., *Journal of Quality Technology* 37 pp 115– (2005)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.