

On the optimality of a class of designs with three concurrences

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Abstract

In the present paper we consider a class of unequally replicated designs having concurrence range 2 and spectrum of the form $\mu_1(\mu_2)^{v-3}\mu_3$. Now, Jacroux's (1985) Proposition 2.4 says that a design with spectrum of the above form, if satisfies some further conditions, is type 1 optimal. Unfortunately, this proposition does not apply to our designs since they have a poor status regarding E-optimality. Yet we are able to prove the A-optimality (in the general class) of these designs using majorisation technique. A method of construction of an infinite series of our A-optimal designs has also been given.

The first and only known infinite series of examples of designs satisfying Jacroux's conditions appears to be the first one in section 4.1 of Morgan and Srivastava (2000) -hitherto referred to as [MS]. In this paper we use majorisation technique to prove stronger optimality properties of the above mentioned designs of [MS] as well as to present simpler proof of another optimality result in [MS].

AMS Subject Classification: 62K10.

Keywords

Majorisation, A-optimality, E-optimality, Type 1 optimality.

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