

Linear sufficiency: a review and some new results

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Abstract

We consider the general linear model $y = Xb + e$, denoted as $M = \{y, Xb, V\}$, supplemented with the new unobservable random vector y_* , coming from $y_* = X_*b + e_*$. A linear statistic Fy is called linearly sufficient for estimable X_*b if there exists a matrix A such that AFy is the best linear unbiased estimator, BLUE, for X_*b . The concept of linear sufficiency with respect to a predictable random vector is defined in the corresponding way but considering the best linear unbiased predictor, BLUP, instead of BLUE. In this talk, we consider the linear sufficiency of Fy with respect to y_* , X_*b , and e_* . Particular attention is being paid on the connection between the linear sufficiency concept and the equality of the multipliers of y providing BLUEs and BLUPs in the original and in the transformed model $T = \{Fy, FXb, FVF'\}$.

Keywords

BLUE, BLUP, Linear sufficiency, Linear model with new observations, Transformed linear model.

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