

**BEST UNBIASED LINEAR ESTIMATION, A COORDINATE FREE
APPROACH**

**S. Gnot
W. Klonecki
R. Zmyślony**

Abstract: This paper gives further developments of the theory of uniformly minimum variance unbiased estimation (UMVUE) in Euclidean vector spaces as originated by W. Kruskal, G. Zyskind and J. Seely. It gives necessary and sufficient conditions for the existence of a UMVUE for each estimable function in any subspace of linear estimators with no restrictions posed on the covariance operators. Also construction of UMVUE's in a given subspace of linear estimators, if they exist, is considered. The developed theory is illustrated by two examples: estimation of variance components in a general mixed linear model and estimation of the mean in a multivariate linear model.

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