

# On REML estimation of variance components and global optimization methods

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## Abstract

The problem of finding residual maximum likelihood (REML) estimate of variance components in the mixed linear model reduces to computing the maximum of the marginal likelihood function or log-likelihood function corresponding to a maximal invariant (cf. Rao, 1997, chap. 6.4).

It is well known that the marginal likelihood function may have multiple local maxima. In this talk the usefulness of some global optimization approaches (cf. Neumaier, 1994) for computing the global maximum (or global maxima) of the marginal likelihood function will be discussed. The results will be illustrated with a couple of numerical experiments

## Keywords

Mixed linear model, Maximum likelihood estimation.

## References

- Neumaier, A. (2004). Complete search in continuous global optimization and constraint satisfaction. In: A. Iserles (Ed.), *Acta Numerica 2004* (pp. 271–369). Cambridge University Press.
- Rao, P. (1997). *Variance Components Estimation. Mixed models, methodologies and applications*. London: Chapman and Hall.