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Performance of confidence intervals in regression models with unbalanced one-fold nested error structures. (English) [Zbl 1081.62540](#)

Commun. Stat., Simulation Comput. 32, No. 3, 717-732 (2003).

Summary: We consider the problem of constructing confidence intervals for a linear regression model with unbalanced nested error structure. A popular approach is the likelihood-based method employed by PROC MIXED of SAS. We examine the ability of MIXED to produce confidence intervals that maintain the stated confidence coefficient. Our results suggest that intervals for the regression coefficients work well, but intervals for the variance component associated with the primary level cannot be recommended. Accordingly, we propose alternative methods for constructing confidence intervals on the primary level variance component. Computer simulation is used to compare the proposed methods. A numerical example and SAS code are provided to demonstrate the methods.

MSC:

- [62J05](#) Linear regression; mixed models
- [62F25](#) Parametric tolerance and confidence regions
- [62J10](#) Analysis of variance and covariance (ANOVA)
- [65C60](#) Computational problems in statistics (MSC2010)

Cited in **1** Review
Cited in **13** Documents

Software:

[MIXED](#); [SAS](#)

Full Text: [DOI](#)

References:

- [1] DOI: 10.1002/0471725153 · [doi:10.1002/0471725153](#)
- [2] DOI: 10.1080/03610929408831364 · [Zbl 0825.62194](#) · [doi:10.1080/03610929408831364](#)
- [3] Eubank, L., Seely, J. and Lee, Y. 2001. Unweighted mean squares for the general two variance component mixed model. *Proceedings of Graybill Conference*. June2001. pp.281–290. CO: Ft. Collins.
- [4] DOI: 10.1214/aos/1176343586 · [Zbl 0344.62060](#) · [doi:10.1214/aos/1176343586](#)
- [5] DOI: 10.1080/00949659008811240 · [doi:10.1080/00949659008811240](#)
- [6] DOI: 10.2307/2289949 · [doi:10.2307/2289949](#)
- [7] DOI: 10.2307/2290779 · [Zbl 0785.62029](#) · [doi:10.2307/2290779](#)

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