

Laplace approximation for linear mixed-effect models under elliptically contoured distributions

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The linear mixed-effect model has been studied under the assumption of normal distribution for the random effects and within-subject errors, which makes the inference vulnerable to outlying observations. It is well known that models developed under elliptical distributions with longer-than-normal tails may robustify the maximum likelihood estimates. We discuss an extension of the linear mixed model based in the class of elliptical distributions. A computationally efficient approach for maximum likelihood estimation using a Laplacian approximation is described. Our model allows the accommodation and identification of outliers either in the random effects or in the within-subject errors. The results are illustrated with a real dataset.