INFLUENCE DIAGNOSTICS IN ELLIPTICAL LINEAR MIXED MODELS

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In this work we discuss robustness aspects of the maximum likelihood estimates against perturbation schemes in elliptical linear mixed models. The elliptical class provides a useful generalization of the normal model since it covers both light and heavy-tailed distributions for the errors, such as Student-t, power exponential, contaminated normal, among others. It is well-known that elliptical models with longer-than-normal tails may present robust parameter estimates against outlying observations, however few has been investigated on the robustness aspects of the parameter estimates under perturbation schemes in the model (or data). We use the local influence methodology to derive appropriate diagnostic graphics to detect the most sensitive observations under some perturbation schemes. Estimation procedures for the fixed parameters and variance components are also presented. An illustrative example previously analyzed under normal mixed models is reanalyzed under elliptical mixed models with heavier-tailed errors and some robustness aspects are investigated. Our conclusion is that the maximum likelihood estimates from elliptical mixed models with longer-than-normal tails for the errors seem to be more robust against some perturbation schemes than the normal mixed model estimates and local influence graphics may be a useful way to select less sensitive error distributions in the elliptical class.