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## Non-Standard Problems in Inference for Additive and Linear Mixed Models

By Sonja Greven

Cuvillier Verlag Jan 2008, 2008. Taschenbuch. Book Condition: Neu. 208x144x15 mm. Neuware - Linear mixed models are a powerful inferential tool in modern statistics and have a wide range of applications. Recent advances utilize the connection between penalized spline smoothing and mixed models for efficient implementation of nonparametric and semiparametric regression techniques. These become increasingly important to adequately model the relationship between response variables and covariates. However, despite their common use, some open questions regarding the inference in mixed models still remain. This dissertation is aimed at improving the methodology for inference on random effects. An important special case is testing for polynomial regression against a general smooth alternative modeled by mixed model penalized splines. Our motivating application is the assessment of non-linearity for air pollution dose-response functions in the epidemiological Airgene study. Testing for a zero random effects variance is a non-standard testing problem. First, the tested parameter is on the boundary of the parameter space under the null hypothesis. Second, in linear mixed models observations are generally not independent. While in longitudinal linear mixed models there are at least independent subjects or units, such a subdivision of the data is not possible for mixed model penalized spline smoothing....



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