Robust ANOVA   tests based on tau-estimators

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ANOVA tests are standard procedures to compare nested linear models. These tests are equivalent to likelihood ratio tests and hence are very powerful. However, these tests inherit the high vulnerability of least squares estimators to the presence of outliers. To avoid this problem one can use robust regression estimators instead. We focus on tau-regression estimators, which combine good robustness properties with high-efficiency at the assumed model, and propose a robust likelihood ratio type test statistics based on the tau-estimates of the error scale. To estimate the null distribution of the test statistic we derive an asymptotic approximation and also adapt a fast robust bootstrap method. We report the results of a simulation study to compare the robustness and power of the resulting robust likelihood ratio type tests with other existing proposals.