

## Some remarks on Bayesian inference for one-way ANOVA models

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**Abstract** We consider the standard one-way ANOVA model; it is well-known that classical statistical procedures are based on a scalar non-centrality parameter. In this paper we explore both marginal likelihood and integrated likelihood functions for this parameter and we show that they exactly lead to the same answer. On the other hand, we prove that a fully Bayesian testing procedure may provide different conclusions, depending on what is considered to be the real quantity of interest in the model or, said differently, which are the competing hypotheses. We illustrate these issues via a real data example.

**Keywords** Integrated likelihood · Marginal likelihood · Model choice · Objective Bayes factor · Reference prior