

# INVESTIGATIONS INTO A BAYESIAN APPROACH TO INVERSE PROBLEMS

Marco A. López & Emile Doering

## **Abstract**

Some difficulties arise in the analysis of inverse problems. The relationship between data and a model is often such that linear regression methods cannot be used. Some regularization methods exist (such as Tikhonov regularization) that impose constraints and help obtain meaningful solutions to ill-posed inverse problems. Another option is to take a Bayesian approach in which a probability distribution is assigned to the unknown model and the model constraints are translated into probabilistic statements. Here we have shown that some unforeseen problems arise with the Bayesian approach and the confidence region thus obtained can be misleading without a careful interpretation.