Test Experiment 1a

Zhe Sha

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1 Introduction

1. Experiment 1a setting

2 Priors for the hyper parameters

2. Transformation of the hyper parameter and choosing the prior

3 Test error size

3. Test the "Principle of stable inference" theorem

3.1 Change error size of a single point

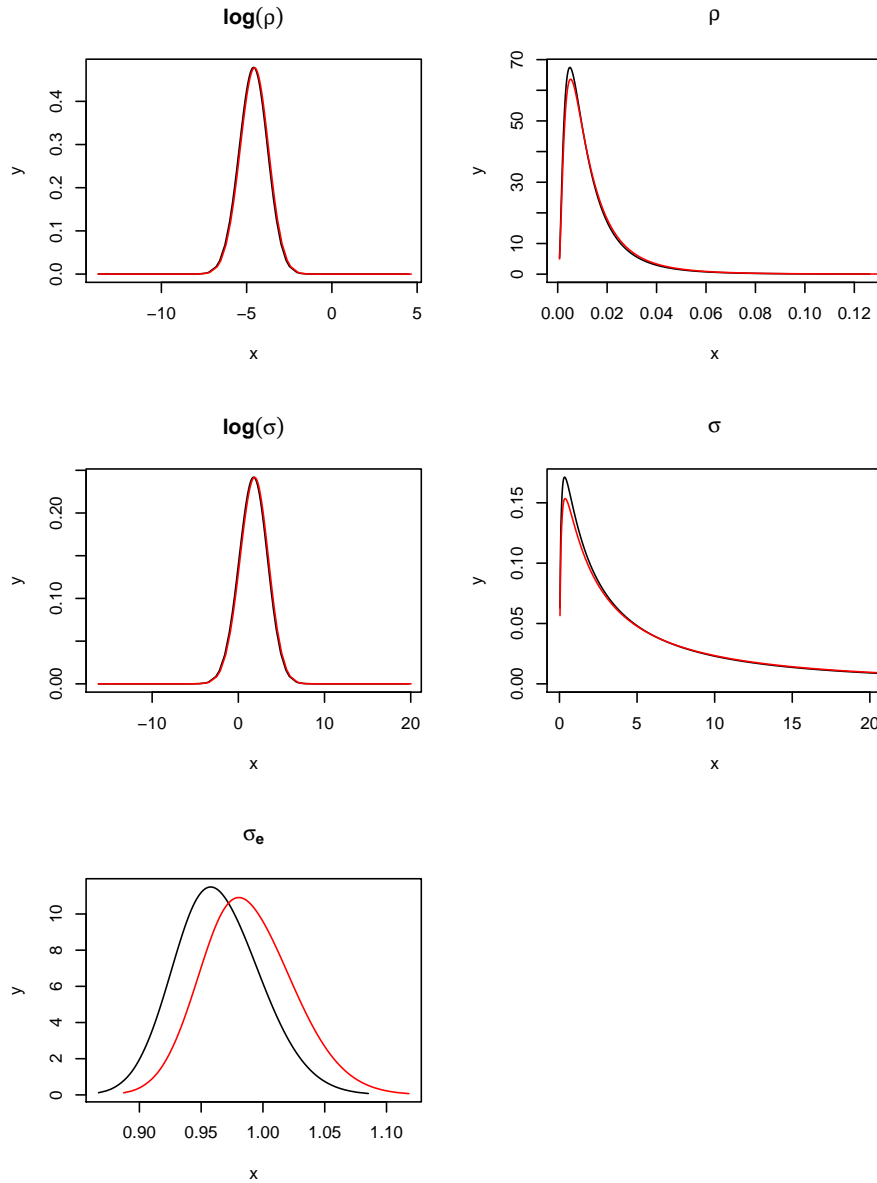Compare the effect of error size using a single isolated point.

Figure 1: Posteriors of the hyper parameters using different error size for a selected point. Black: small error, Red: large error.

Posterior marginal standard error –– Small error

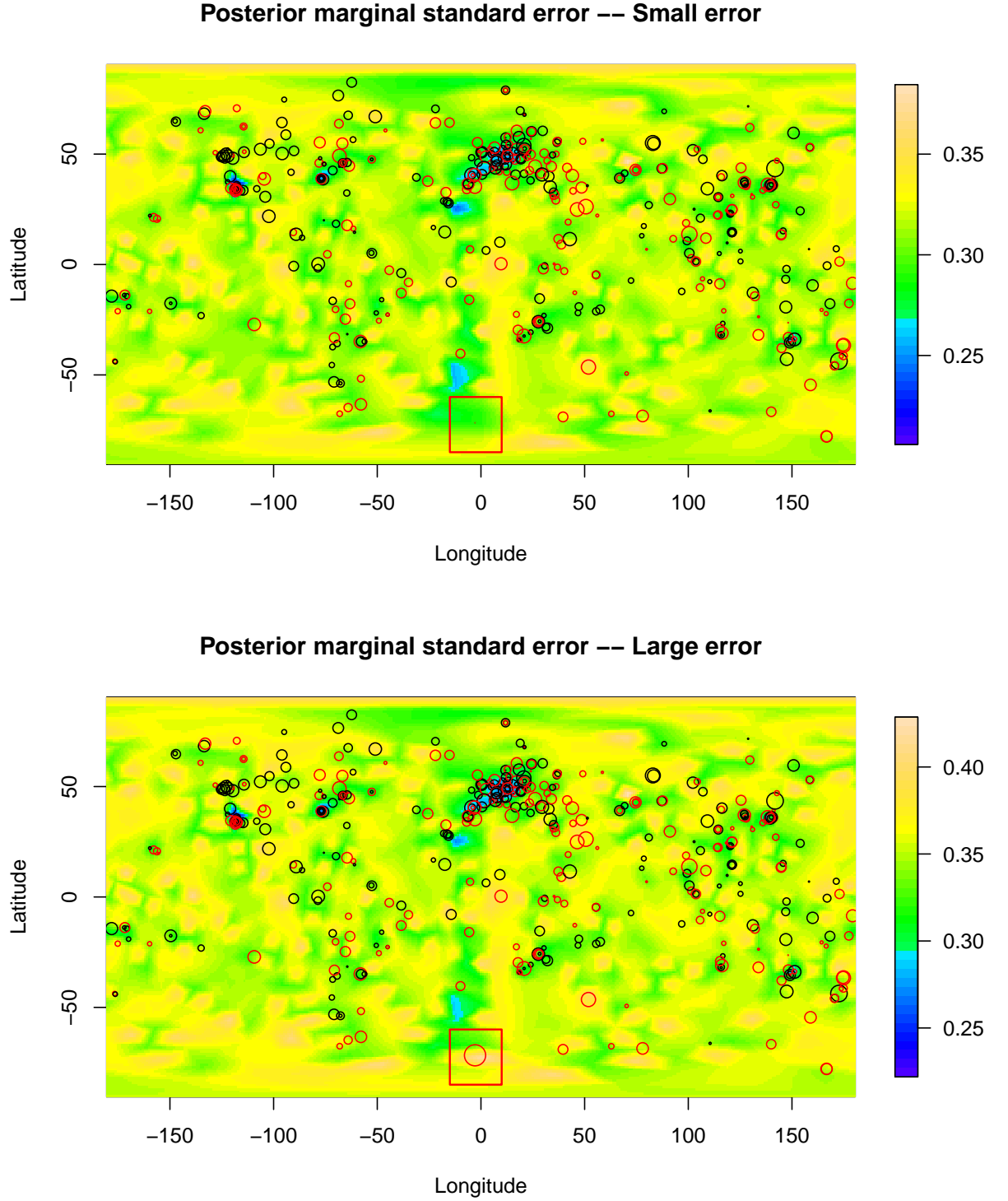

Posterior marginal standard error –– Large error

Figure 2: Posteriors marginal standard errors of the latent field using GPS data with different error on a single selected point. The selected point is marked as the circle within the red rectangle. Points are the GPS locations. Red points are positive errors and black negative. The circle size in the bottom plot represents the error size.
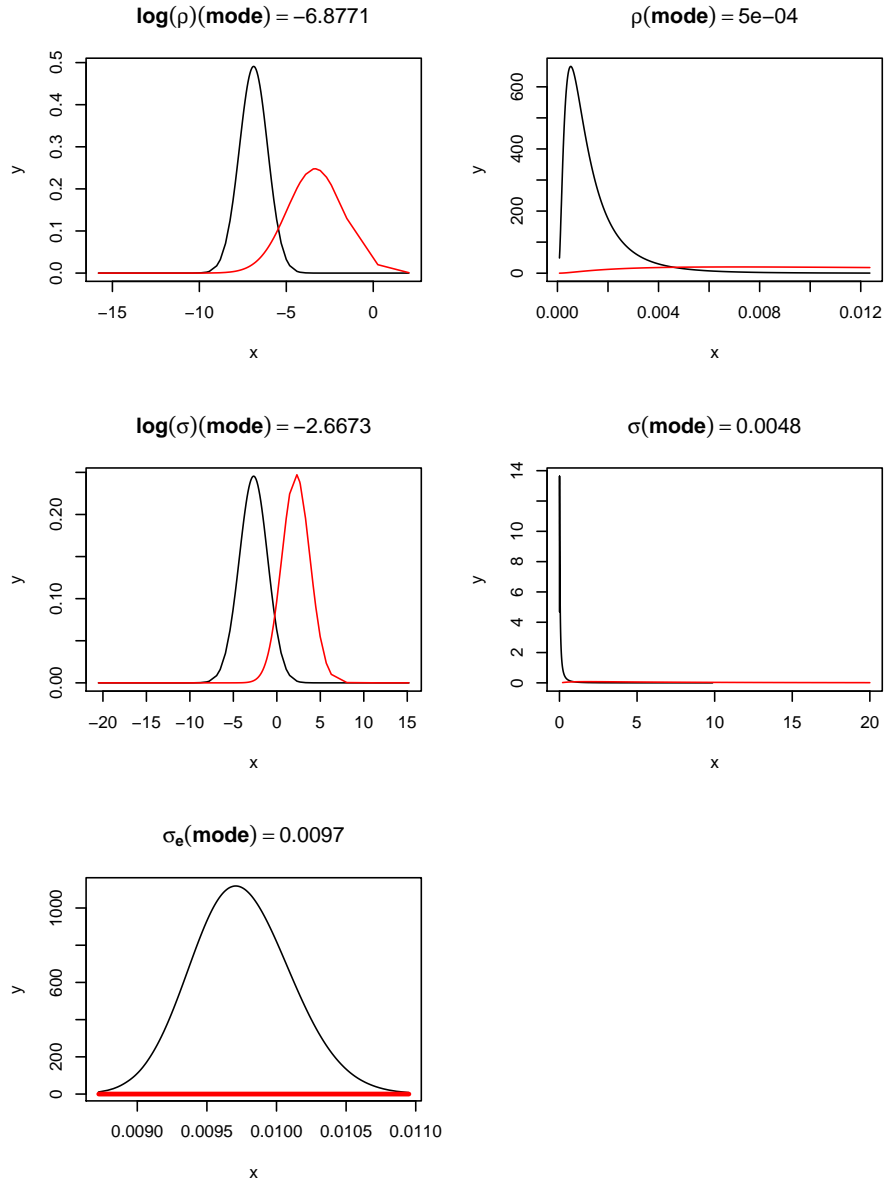
3

3.2 Change global error size

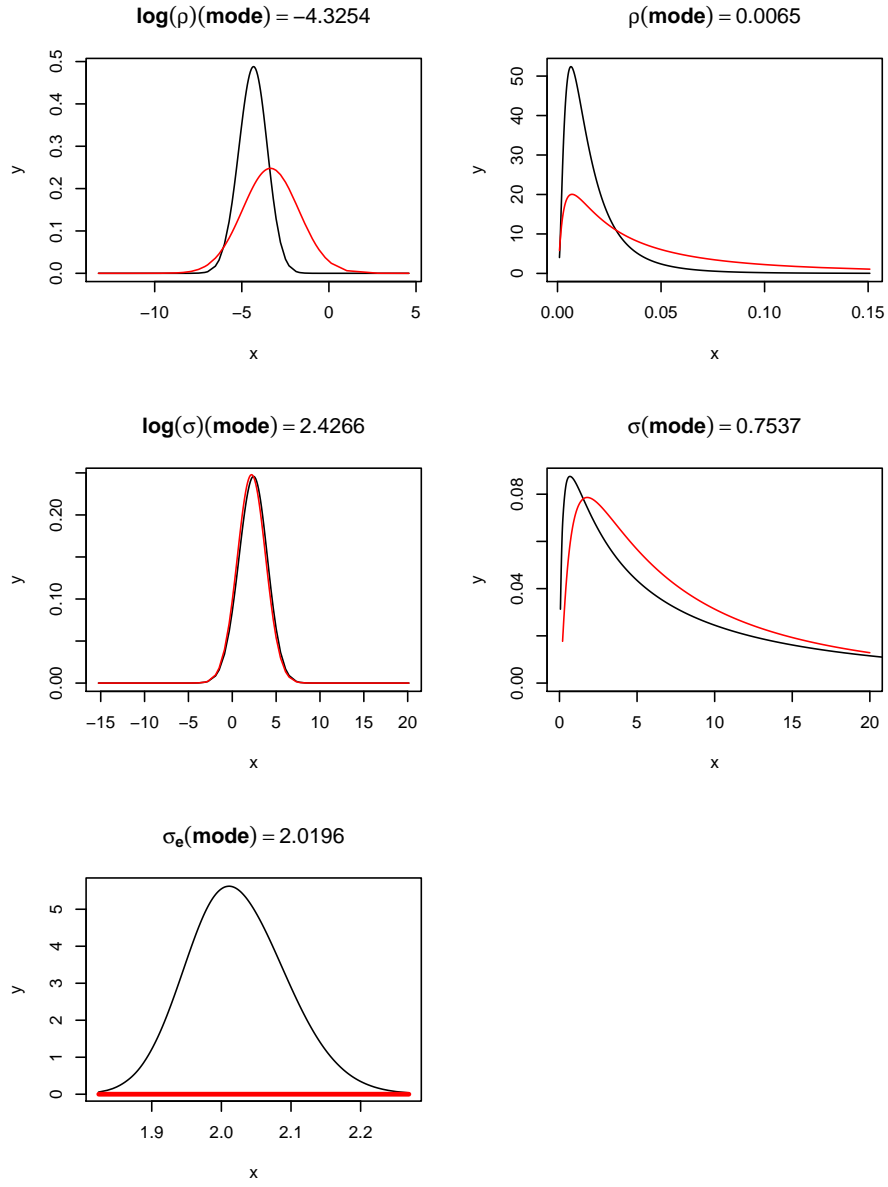Figure 3: Posteriors of hyper parameters using GPS data with small measurement errors. Black: posterior, Red: prior.

Figure 4: Posteriors of hyper parameters using GPS data with large measurement errors. Black: posterior, Red: prior.

Posterior marginals -- mean
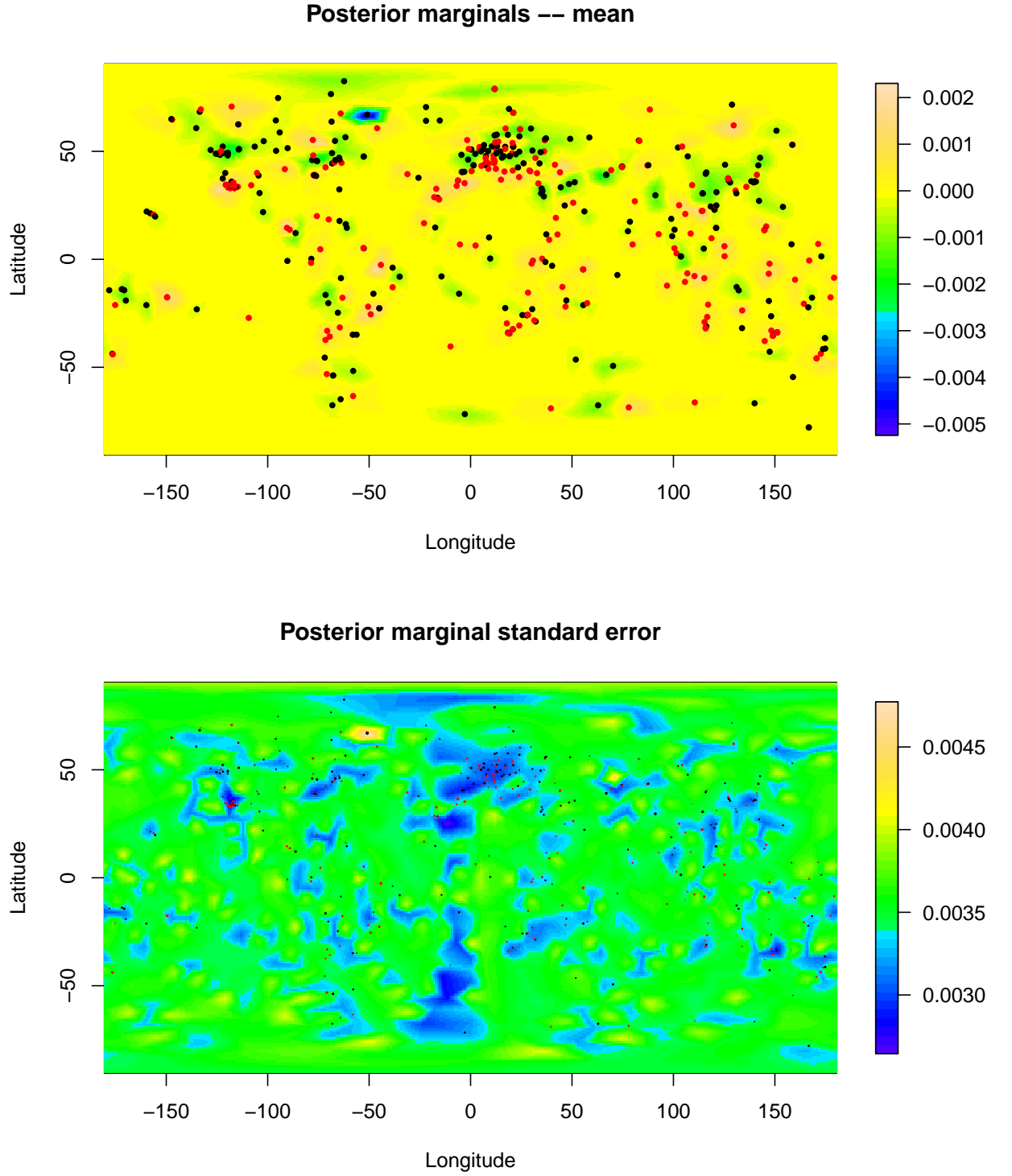
Posterior marginal standard error

Figure 5: Posteriors marginal means and standard errors of the latent field using GPS data with small measurement errors. Points are the GPS locations. Red points are positive errors and black negative. The circle size in the bottom plot represents the error size.

Posterior marginals -- mean

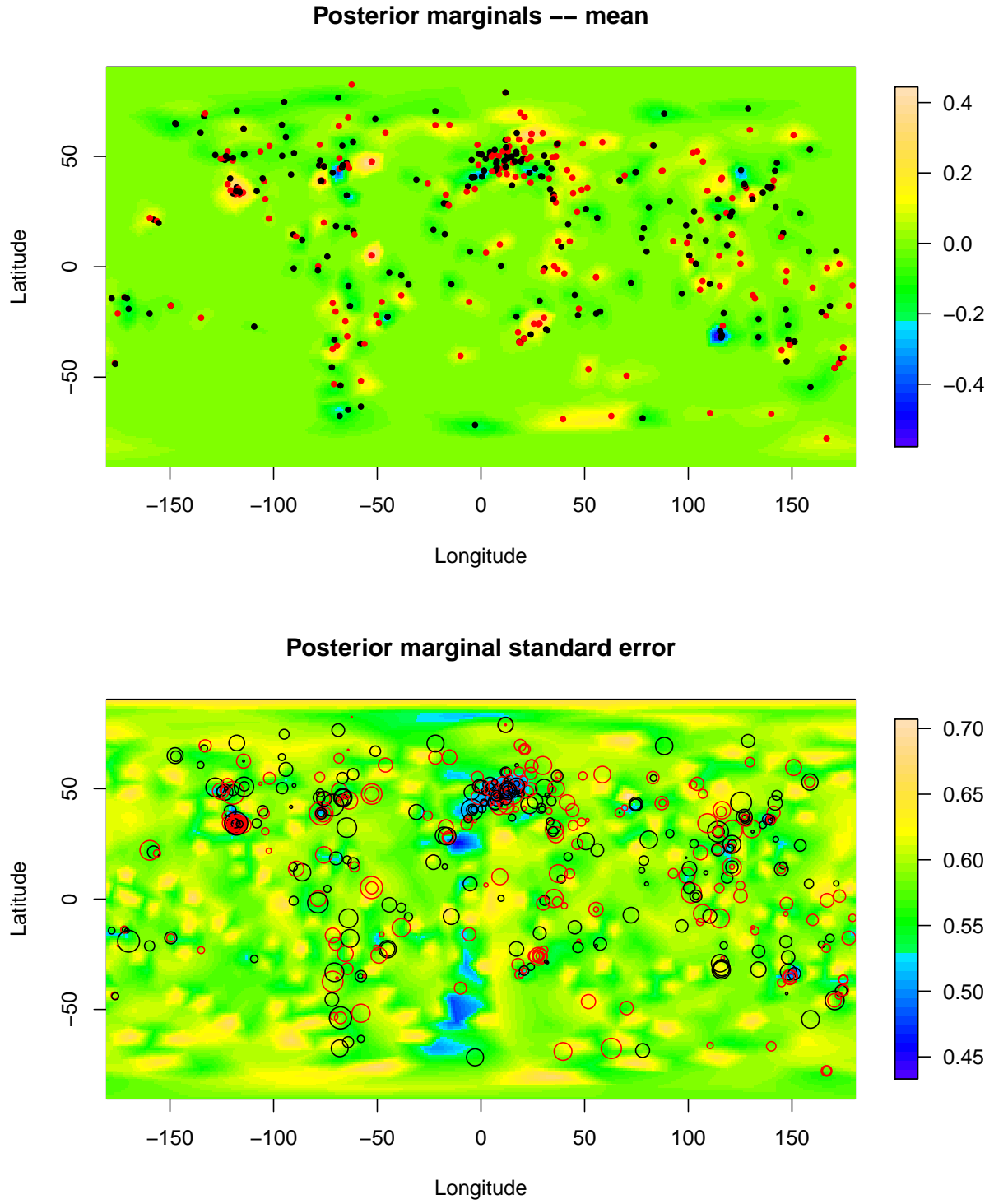## Posterior marginal standard error

Figure 6: Posteriors marginal means and standard errors of the latent field using GPS data with large measurement errors. Points are the GPS locations. Red points are positive errors and black negative. The circle size in the bottom plot represents the error size.
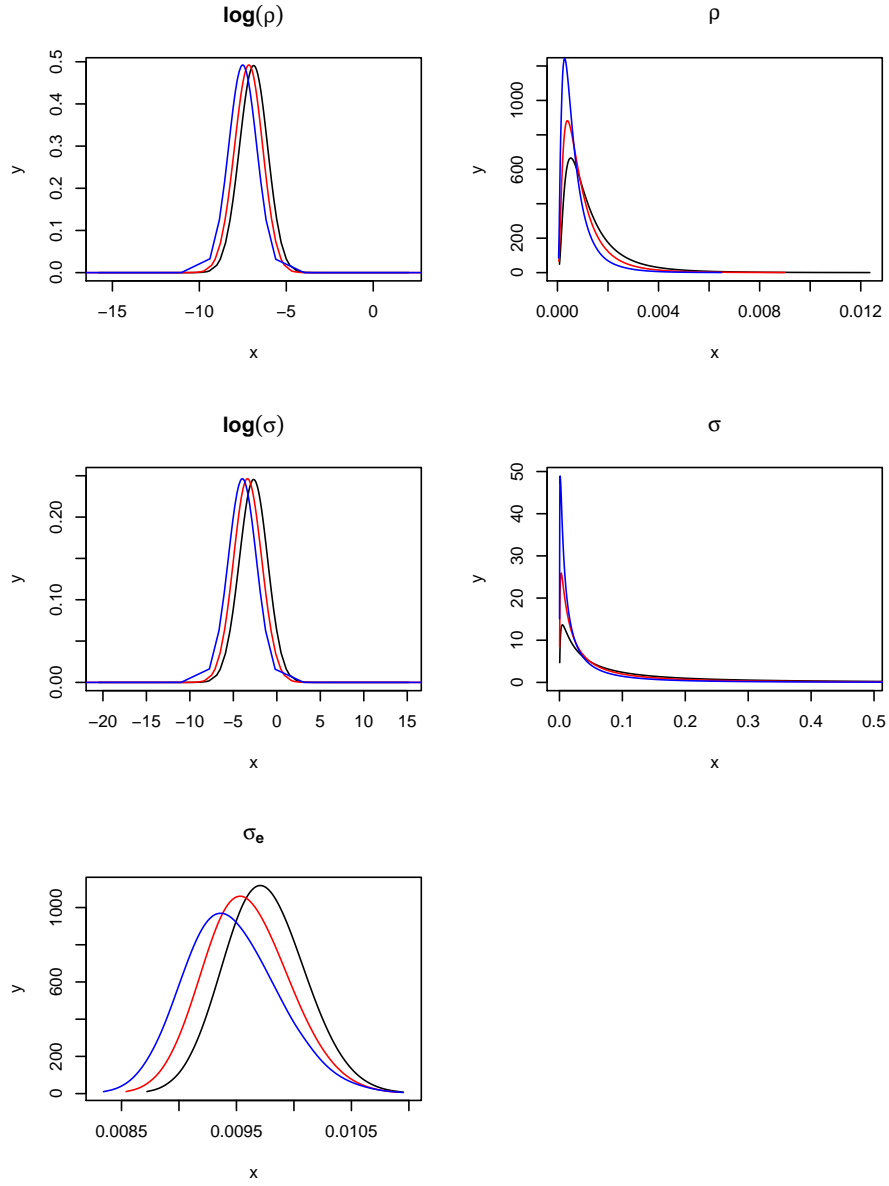
4   Effect of Mesh size

Figure 7: Posteriors of hyper parameters estimated using different mesh sizes for the latnet process. Black: small, Red: medium, blue: large.
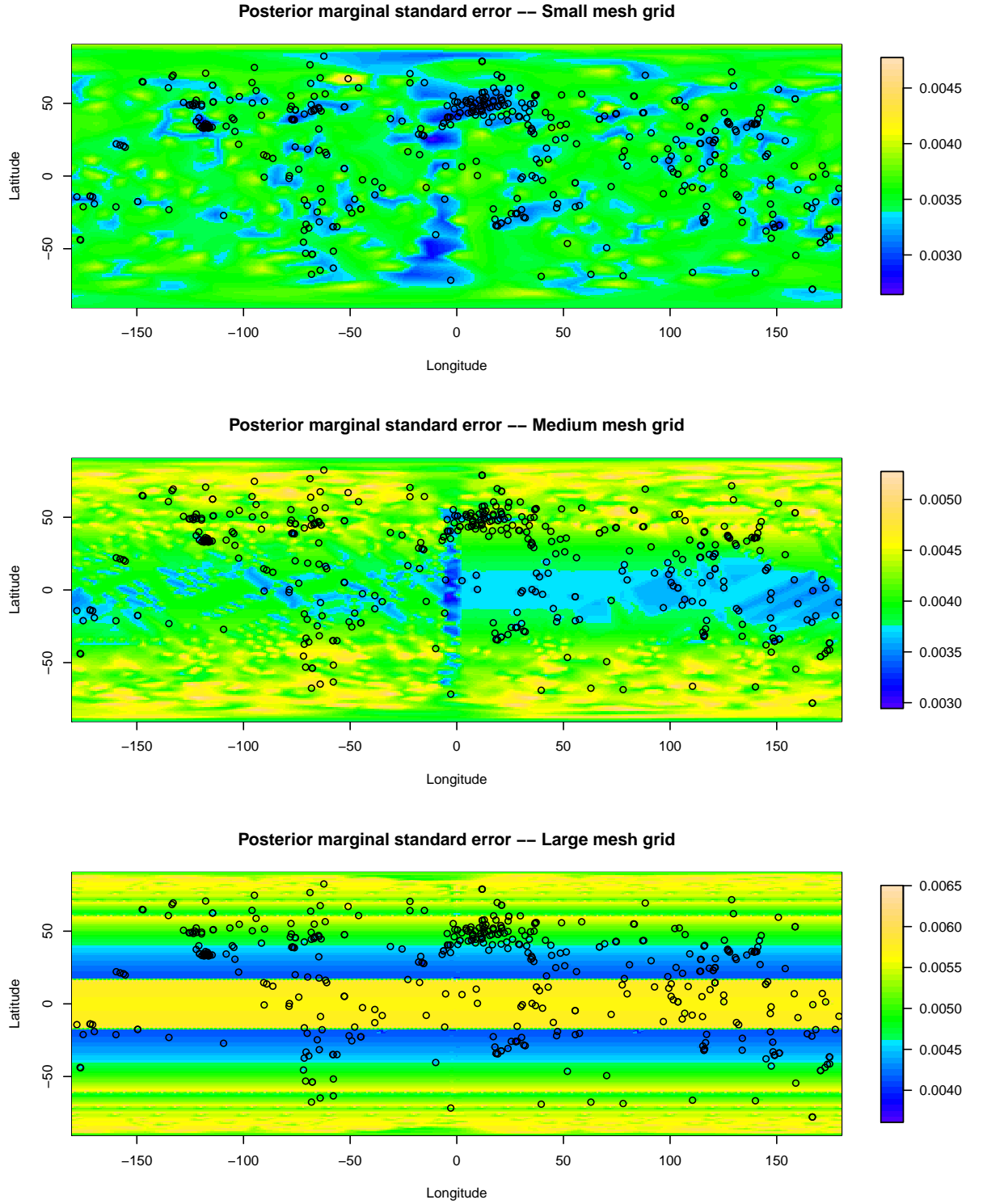
Figure 8: Posteriors marginal standard errors of the latent field with different mesh sizes. Points are the GPS locations.