

Figure S1. Five bivariate Laplace densities.

Figure S2. Double exponential versus marginal (from bivariate Laplace) versus normal densities

Figure S3. Normalized densities of mixing variable in MCMC algorithm

Figure S4. Shrinkage factor: mean trait 1

Figure S5. Shrinkage factor: mean trait 2

Figure S6. Shrinkage factor: marker 10, trait 1

Figure S7. Shrinkage factor: marker 200, trait 2

Figure S8. Shrinkage factor:  $R0[1,1]$

Figure S9. Shrinkage factor:  $R0[1,2]$

Figure S10. Shrinkage factor:  $R0[2,2]$

Figure S11. Shrinkage factor:  $SIGMA[1,1]$

Figure S12. Shrinkage factor:  $SIGMA[1,2]$

Figure S13. Shrinkage factor:  $SIGMA[2,2]$

Figure S14. Trace plots of  $R0[1,1]$ ,  $R0[1,2]$ ,  $R0[2,2]$

Figure S15. Trace plots of  $SIGMA[1,1]$ ,  $SIGMA[1,2]$ ,  $SIGMA[2,2]$

Figure S16. Path to convergence in MAP-MBL (maximum a posteriori-multiple trait Bayesian LASSO)

Figure S17. BLUP of marker effects versus MBL posterior means and MAP-MBL solutions

Figure S18. Fitted genetic values: BLUP, MBL and MAP-MBL