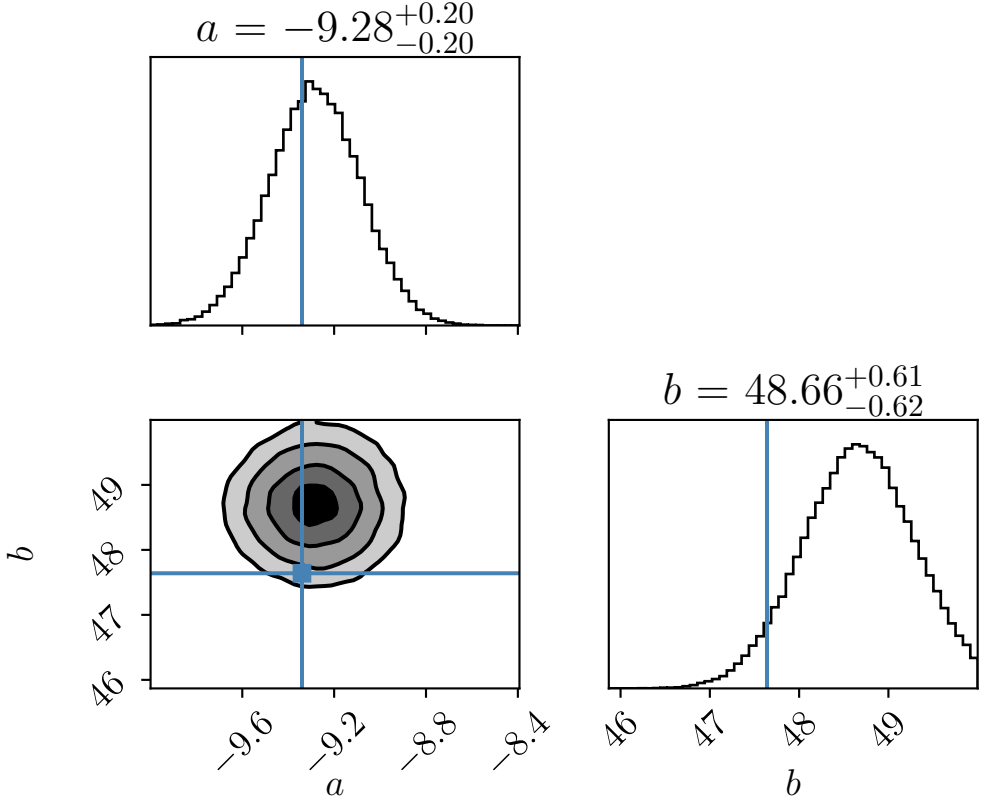
Probability densities and correlations (MCMC)

$p(\boldsymbol{x}|\boldsymbol{y}) \sim \boldsymbol{x} = (x_1, x_2)^\top = (a, b)^\top$