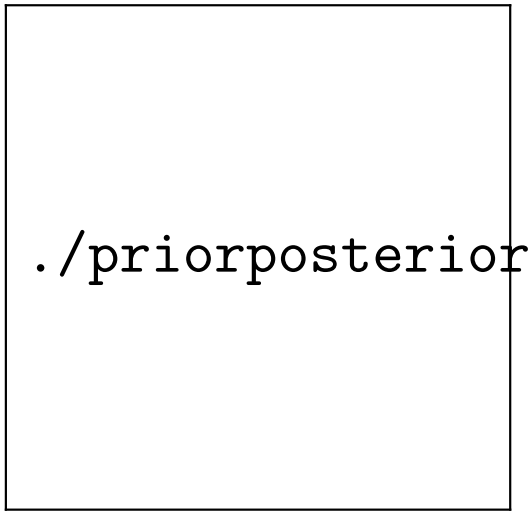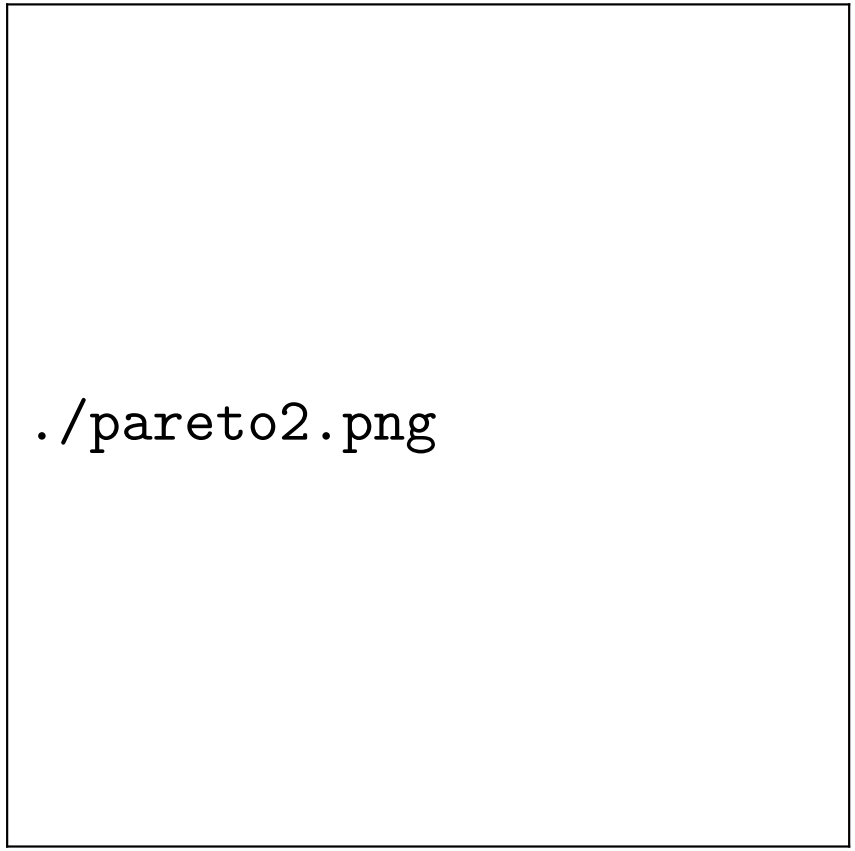MCMc simulation