Thank you very much for considering our Letter “Efficient Bayesian Phase Estimation” for publication in Physical Review Letters. Our Letter makes a substantial stride in the field of quantum information by giving a new method for performing phase estimation, which is one of the most important subroutines in quantum computing and quantum simulation. Recent work has shown that Bayesian inference provides an optimal phase estimation algorithm, but unfortunately exact Bayesian inference is intractable for phase estimation. Here we address this problem by introducing an elegant form of approximate Bayesian inference that can be efficiently implemented with very little computational cost. This new inference method is not only faster than other efficient methods, but also is robust to experimental noise and can even be used to track excitations in a quantum system in real time.

Our work will therefore be important not only to the theoretical community but also to experimentalists who currently struggle against decoherence to implement phase estimation in practice. Because our work is impactful to a wide range of physicists and enables new classes of experiments that would otherwise be challenging with existing hardware, we feel that our work is ideally suited for publication in Physical Review Letters.

Regards,

Nathan Wiebe  
Microsoft Research