Budget Impact/Change of Scope Statement for
Cost-Efficient and Confident Sampling for
Modern Scientific Discovery

We highlight under each proposed task what can and cannot be done in light of the budget reduction.

1. Developing Cost-Efficient and Confident Sampling

1.1. Bayesian Sampling for Expensive Posteriors We will develop the proposed ESP sampler (with supporting methods and algorithms) as initially proposed. We will explore associated theoretical rates and central limit theorems if there are sufficient resources at the end of the project. These methods will be applied to physical science and engineering applications, as initially intended.

1.2. Adaptive Multifidelity Algorithms While we will extend our rigorous data-based stopping rules to multifidelity problems, the class of problems that we may be able to address during the life of the award will be somewhat *smaller than* originally proposed. New algorithms will be implemented and tested on real applications as originally proposed.

1.3. Big Data Subsampling The development of the LD subsampling method will proceed as proposed. We will explore its implementation in a broad range of test cases, but its application for real-time UAV flight may be deferred unless there is sufficient time and resources at the end of the project.

1.4. Distribution, Density and Quantile Estimation The exploration of the effectiveness of LD Sequences for these important problems that are beyond computing integrals or expectations will proceed, but not as large in scope as originally proposed. We will test our new methods on some industrial strength applications as originally proposed.

2. Broader Impacts

2.1. Dissemination to the Broad Scientific Community. Given the reduction in travel budget and the elimination of the budget to host visitors and pay for article processing charges, as recommended by the program director, our dissemination efforts may not be as effective as originally envisioned, however, we will use electronic communication to accomplish what we can with limited travel.

2.2. QMCPy as a Proving Ground. We will continue to build our user and developer base of QMCPy as proposed.

2.3. Promoting Proper QMC Practice and Code. We will use online discussion groups along with some travel to grow the QMC community developing good code.

2.4. Training the Next Generation of *Science-Based* Computational Researchers. Given the reduction in student support, we will look for other opportunities not funded by this grant to leverage what this grant provides to train computational researchers. We have retained support for a PhD student for three years.

2.5. Incorporating Diversity, Equity and Inclusion We will look for collaborations with under-served groups outside what can now be funded by this grant, but we may not be able to fund as many summer students as originally planned. We may request an REU supplement.