OOKAMI PROJECT APPLICATION

Date: 3/24/2021

Project Title: The AMReX Block-Structured Adaptive Mesh Refinement Framework

Usage:

- Testbed

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AMReX is a software framework for building massively parallel, block-structured adaptive mesh refinement applications. It forms the basis for the spatial and temporal discretization of a large number of application codes, spanning scientific domains such as astrophysics and cosmology, particle accelerators, combustion research, and wind farm modelling. Funded by the Exascale Computing Project, AMReX supports a variety of compute backends: OpenMP for many- and multi-core architectures, and CUDA, HIP, or DCP++ for accelerator-based machines. However, we are very interested in supporting non-ECP platforms as well. Our goal in using Ookami is to make sure AMReX and its application codes run and perform well on ARM systems. Since this work would benefit all users of our framework, the ultimate impact in terms of enabling production science calculations should he high.

Usage Description:

Computational Resources:

- Total node hours per year: 3,000

- Size (nodes) and duration (hours) for a typical batch job: Our primary use case will be relatively small test runs for porting, benchmarking, and performance tuning, say 1-4 nodes for 1-2 hours at a time. If possible we would also do scaling studies, but this has been done on other platforms and is not essential.

- Disk space (home, project, scratch): We anticipate only modest disk usage, maybe 10 TB or less.

Personnel Resources:

We do not anticipate needing assistance beyond a help desk-type system where we can ask occasional questions.

Required software:

A C++14-capable compiler, a Fortran compiler, MPI, OpenMP.

If your research is supported by US federal agencies: