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Implementing Parquet equations using HPX[1] SAMUEL KELLAR, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, Louisiana, BIBEK WAGLE, Department of Computer Science and Engineering, Louisiana State University, Baton Rouge, Louisiana, SHUXIANG YANG, KA-MING TAM, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, Louisiana, HARTMUT KAISER, Center of Computation and Technology, Louisiana State University, Baton Rouge, Louisiana, JUANA MORENO, MARK JARRELL, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, Louisiana — A new C++ runtime system (HPX) enables simulations of complex systems to run more efficiently on parallel and heterogeneous systems. This increased efficiency allows for solutions to larger simulations of the parquet approximation for a system with impurities. The relevancy of the parquet equations depends upon the ability to solve systems which require long runs and large amounts of memory. These limitations, in addition to numerical complications arising from stability of the solutions, necessitate running on large distributed systems. As the computational resources trend towards the exascale and the limitations arising from computational resources vanish efficiency of large scale simulations becomes a focus. HPX facilitates efficient simulations through intelligent overlapping of computation and communication. Simulations such as the parquet equations which require the transfer of large amounts of data should benefit from HPX implementations.

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