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Implementation of the conjugate gradient algorithm for heterogeneous systems

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Lattice QCD calculations require a relevant computational effort and most of the computer time is typically spent in the numerical inversion of the Dirac-Wilson operator. One of the simplest methods to solve large and sparse linear systems is the conjugate gradient (CG). In this work we present an implementation of the CG that can be executed on different devices, including CPUs, GPUs and FPGAs. This is achieved by using SYCL/DPC++ framework, that allows the execution of the same source code on heterogeneous systems.

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