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Abstract: With the ever increasing size of numerical simulations, a major challenge for the HPC community is to take advantage of current hybrid architectures. The use of GPU computing appears most of the time as an efficient way to accelerate execution time and to obtain scalable applications.

One main difficulty of this type of computing is that it might be necessary to rewrite significant parts of the codes and sometimes to change the algorithm itself. However, the use of external HPC libraries offers the possibility to avoid redesigning all the code. MAGMA is a linear algebra library providing support for accelerators such as NVIDIA GPUs, Intel Xeon Phi (MIC), or any system that can work with OpenCL. Despite being originally focused on dense linear algebra problems, it also contains solvers, preconditioners and eigensolvers for sparse linear systems.

In the case of TELEMAC-2D, the code is based on finite element/finite volume method and a mesh of triangular elements to solve the SaintVenant equations. It deals mostly with sparse matrices and uses Krylov methods such as GMRES or the Conjugate Gradient to solve the large sparse linear systems resulting from the discretization.

In this study, we present preliminary results for the use of MAGMA in the case of the Malpasset simulation with different mesh sizes. We also describe the different steps and some issues encountered as well as the profiling results for the CPU and the GPU versions of the code.