



Mixed precision numerical weather prediction on hybrid GPU-CPU supercomputers

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A new version of the climate and weather model COSMO that runs faster on traditional high performance computing systems with CPUs as well as on heterogeneous architectures using graphics processing units (GPUs) has been developed. The model was in addition adapted to be able to run in “single precision” mode. After discussing the key changes introduced in this new model version and the tools used in the porting approach, we present 3 applications, namely the MeteoSwiss operational weather prediction system, COSMO-LEPS and the CALMO project, which already take advantage of the performance improvement, up to a factor 4, by running on GPU system and using the single precision mode. We discuss how the code changes open new perspectives for scientific research and can enable researchers to get access to a new class of supercomputers.