

GPU Acceleration of Numerical Weather Prediction

John Michalakes
NCAR
john@michalakes.us

Weather and climate models applications involve fixed size problems with time-to-solution requirements and thus require strong scaling. There are any number of challenges to reaching petascale with these models, among them the ability to exploit all granularities of parallelism, including fine-grained, the original domain of vector systems – also originally considered difficult to program. Recent efforts to recover fine-grained parallelism are exploring emerging architectures such as GPUs – currently regarded as difficult to program. This is justified. This talk will discuss ongoing efforts and experiences applying GPU acceleration to the Weather Research and Forecast (WRF) model within current programming environments. Additional information is available at <http://www.mmm.ucar.edu/wrf/WG2/GPU>.