

Experimental Results

Table: Execution time (Seconds)

Benchmark	CUDA (Nvidia K40)			OpenMP (Broadwell-EP CPU E5-2630 v4 @2.20GHz)					
	Manual	Manual_opt (coal, sh_mem, occu, reg_pres)	GridTools	OMP_THREADS=1		OMP_THREADS=5		OMP_THREADS=10	
				Manual	GridTools	Manual	GridTools	Manual	GridTools
Diffusion	5.83	0.575 (5.23x OMP=10)	0.61 (4.93)	19.2 (1.0x)	19.4 (1.0x)	4.3 (4.46x)	5.8 (3.34x)	2.2 (8.72x)	3.01 (3.22x)
Divdamp (vgrid40_600m_24km)	35.23	3.15 (4.83x OMP=10)	3.17 (4.80x)	74.3 (1.0x)	74.3 (1.0x)	15.4 (4.81x)	30.08 (2.47x)	7.7 (4.78x)	15.22 (2.44x)
Vi_rhow_Solver (vgrid40_600m_24km)	0.91	0.288 (6.14x OMP=10)	0.311 (5.69x)	12.0 (1.0x)	12.1 (1.0x)	2.4 (4.9)	3.18 (3.8x)	1.23 (4.87)	1.77 (3.4x)

- Operation time only (I/O, validation, ..., etc not included)
- Regular regions only (Polar regions excluded)
- 1000 iterations
- # regions = 1, # MPI ranks = 1, 130x130x42 grid