



# OMPM2001 Result

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## IBM Corporation

IBM eServer pSeries 690 Turbo (1700 MHz, 32 CPU)

SPECompMpeak2001 = 38447

SPECompMbase2001 = 35267

SPEC license #HPG0005 | Tested by: IBM | Test site: IBM, Austin, TX | Test date: Aug-2003 | Hardware Avail: May-2003 | Software Avail: Jul-2003

Benchmark	Reference Time	Base Runtime	Base Ratio	Peak Runtime	Peak Ratio	
310.wupwise_m	6000	112	53712	112	53712	
312.swim_m	6000	158	37872	125	48082	
314.mgrid_m	7300	218	33471	218	33471	
316.applu_m	4000	106	37785	84.9	47128	
318.galgel_m	5100	310	16477	206	24806	
320.quake_m	2600	95.4	27242	98.4	26436	
324.apsi_m	3400	67.5	50370	67.5	50370	
326.gafort_m	8700	169	51481	167	51977	
328.fma3d_m	4600	176	26209	170	26994	
330.art_m	6400	79.2	80776	79.5	80550	
332.ammp_m	7000	423	16557	392	17840	

### Hardware

CPU: POWER4+  
 CPU MHz: 1700  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 16 chips, 2 cores/chip, 4 chip/MCM  
 CPU(s) orderable: 1,2,3,4 (order by # MCM)  
 Primary Cache: 64KBI+32KBD (on chip)/core  
 Secondary Cache: 1536KB unified (on chip)/chip  
 L3 Cache: 128MB unified (off chip)/MCM, 4 MCM in SUT  
 Other Cache: None  
 Memory: 256 GB  
 Disk Subsystem: 1x36GB SCSI, 10K RPM  
 Other Hardware: None

### Software

OpenMP Threads: 32  
 Parallel: OpenMP  
 Operating System: AIX 5L V5.2  
 Compiler: IBM C for AIX, Version 6.0  
 IBM XL FORTRAN for AIX, Version 8.1.1.0  
 Other Software: ESSL 3.3.0.5, MASS 3.0  
 File System: AIX/JFS  
 System State: Multi-User

## Notes/Tuning Information

Tested by IBM

### Portability Flags & Environment Variables

-bmaxdata:0x80000000 used in all cases except 330.art\_m  
 -bmaxdata:0xD0000000 used in 330.art\_m  
 -qfixed used in: 310.wupwise\_m, 312.swim\_m, 314.mgrid\_m, 316.applu\_m, 324.apsi\_m  
 -qfixed=80 used in: 318.galgel\_m  
 -qsuffix=f=f90 used in: 318.galgel\_m, 326.gafort\_m, 328.fma3d\_m  
 ENV\_XLFRTEOPTS=NAMELIST=OLD used in: 326.gafort\_m

### Base Flags

C: -q64 -O5 -qalign=natural -qipa=partition=large -qmaxmem=-1 -qsmp=omp  
 FORTRAN: -O5 -qalign=natural -qipa=partition=large -qmaxmem=-1 -qsmp=omp

### Base & Peak User Environment:

OMP\_NUM\_THREADS=32  
 OMP\_DYNAMIC=FALSE  
 XL SMP OPTS=SPINS=0:YIELDS=0:STACK=8000000:SCHEDULE=STATIC  
 MALLOCMULTIHEAP=1

### Peak Flags

-qsmp=omp used in all cases  
 310.wupwise\_m: basepeak=true



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## Notes/Tuning Information (Continued)

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312.swim_m:      -O3 -qalign=natural -qtune=pwr4 -qarch=pwr4
314.mgrid_m:    basepeak=true
316.applu_m:    -O3 -qalign=natural -qtune=pwr4 -qarch=pwr4
318.galgel_m:   -O5 -qalign=natural -qhot=arraypad -qessl -qlibessl -lesslsmp
                -lpesslsmp -lblacssmp -lmass -qipa=partition=large -qmaxmem=-1
                ENV_OMP_NUM_THREADS=16
320.equake_m:   -q64 -O5 -qalign=natural -qhot=arraypad -Q
324.apsi_m:    basepeak=true
326.gafort_m:   -O5 -qalign=natural -qhot=arraypad -qipa=partition=large
                -qmaxmem=-1
328.fma3d_m:    -O5 -qalign=natural -qhot=arraypad -qipa=noobject
                -qipa=partition=large -qmaxmem=-1
330.art_m:      -DINTS_PER_CACHELINE=32 -DDBLS_PER_CACHELINE=16
                -q64 -O5 -qalign=natural -qhot=arraypad -Q
332.ampm_m:    -O5 -qalign=natural -qhot=arraypad -Q

```

### Alternate sources:

318.galgel (peak): eigQR.f90 (for portability to lapack version 3).  
 Available as SPEC OMP2001 Source: omp2001-galgel-20020117.tar.gz.

SPEC OMPL2001 source for 32bit systems modified for SPEC OMPM2001.  
 Available as SPEC OMPM2001 Source: ompm2001-srcl32bit-20020925.tar.gz.  
 Used in 312.swim\_m (peak), 316.applu\_m (peak), 326.gafort\_m (peak),  
 328.fma3d\_m (peak).

ISO C and C++ compatible sources available as SPEC OMPM2001 source:  
 ompm2001-fabs-20030418.tar.gz.  
 Used in 330.art\_m (base & peak).

ISO C and C++ compatible sources available as SPEC OMPM2001 source:  
 ompm2001-isoc-20020619.tar.gz.  
 Used in 320.equake\_m (peak) & 332.ampm\_m (peak).

MCM: Acronym for "Multi-Chip Module"  
 SUT: Acronym for "System Under Test"

C: IBM VAC++ invoked as xlc\_r  
 Fortran 90: IBM XL Fortran for AIX invoked as xlf90\_r

APAR IY 36772 was applied to AIX to enable new hardware support.  
 ulimits set to unlimited.

Memory affinity was set as follows:  
 vmo -r -o memory\_affinity=1  
 shutdown -r  
 export MEMORY\_AFFINITY=MCM