

CrystalMk

Summary Version

1.0

Purpose of Benchmark

This single CPU, C program is intended to be an optimization and SIMD compiler challenge.

Characteristics of Benchmark

CrystalMk consists of selected small portions of a large material strength package. The code fragments included in the benchmark do not actually simulate any physics per se. There is a simplified Cholesky linear systems solver (one routine), collected do loops containing divide operations, do loops with calls to built-in math functions (pow), and data setup. The performance of this very small set of coding dominates the performance of the much larger collection of routines that that make up the full physics package.

The instruction mix is about 19% floating point (60% as part of FMA instructions), 31% fixed point, 10% branches, and 39% load/store.

Limitations of Benchmark

Single CPU only.

Mechanics of Building Benchmark

One Makefile is used to build the code. It will require manual modifications (such as compiler, compiler flag, etc.) prior to attempting to build the code.

The benchmark has been compiled using icc, xlc, and PathC and has been run on Xeon, POWER5, and Opteron CPU-based computers.

Mechanics of Running Benchmark

```
./CrystalMk > myoutput
```

where CrystalMk is the executable and myoutput is an arbitrarily named output file of your choosing.

Verification of Results

An example output (result) is provided.