

Re: high-precision eigenvalue solver

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- *From:* "Julian V. Noble" <jvn@xxxxxxxxxxxxx>
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wakun@xxxxxxxxxx wrote:

>
> Thank you for all your suggestions. I found a library in c++ supporting
> quadruple precision and the problem is solved at last with the help of
> the lib. However, it takes almost 10 times longer than that in double
> precision. I am searching a faster package. A guy told me lapack is
> great. However, I found, from <http://www.netlib.org/lapack/>, lapack
> only support double precision.

The reason it takes 10x longer is that everything is done in high-level for portability. If you know how to use assembler you can hand-code the specific quad-precision arithmetic functions you need (you might look at Knuth for clues) and link them to your high-level calling program.

That's something of a pain, but it will reduce the running time about 3-fold. You can't do better than that, because a quad-precision multiplication uses 3 double-precision ones.

The double-precision (aka 64-bit) operations take the same time as the (32-bit) single-precision ones because they are done on a math chip in 80-bit wide registers. (Since the instructions are overlapped on superscalar processors like the Pentia, the extra memory-access time does not increase this factor 3 by more than a few percent, even on systems with 32-bit bus width. Systems with 64-bit buses notice no difference resulting from memory accesses.)

—
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"For there was never yet philosopher that could endure the toothache patiently."

— Wm. Shakespeare, Much Ado about Nothing. Act v. Sc. 1.

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- *Follow-Ups:*

- ◆ *Re: high-precision eigenvalue solver*

- ◇ *From:* Ronald Bruck

- *References:*

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