Subject: Re: complex math error?
Posted by thompson on Thu, 18 May 1995 07:00:00 GMT
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heard@drep.dnd.ca (Garry J. Heard) writes:

> Hi,

> I think we've found an erratic math error in IDL V3.6 (running on a PPC and
> an SGI results were similar). Here it is:

>   print, exp(complex(0,1)*sqrt(2.)*10.)^sqrt(2.)

> Execute the above line a time or two and you'll get the wrong answer, then try
> almost any simple math operation on a complex number. i.e.,

>   print, complex(0,1)^2

> Chances are you'll get a wrong answer again. Try the last operation again
> and you might then get the correct answer. It's an erratic sort of bug and
> seems to have a lot to do with complex numbers and sqrt functions. But it
> is unpredictable. The only way we have been able to induce it so far is to
> raise a complex exponential to a power involving a sqrt. I guess you should
> be wary of any complex math in IDL until RSI has had a look at it. Also, the
> bug may not exist in V4. I think that WAVE may not allow these kinds of
> operations on complex values, so in a way that will protect you from this
> bug (I might be wrong about this since I don't have a current WAVE version
> to try it on).

I can't make it fail running IDL 3.6.1c under OSF/1 v2.0 on an AXP 3000/600
workstation. I always get the result

```
 IDL> print, exp( complex(0,1)*sqrt(2.)*10. )^sqrt(2.)
 ( -1.28269e-10,  1.66070e-10)
```

no matter how many times I try it. (I assume that's the correct value.) Also,
I always get

```
 IDL> print, complex(0,1)^2
 (     -1.00000,      0.00000)
```

Bill Thompson

Subject: Re: complex math error?
Posted by llobet on Fri, 19 May 1995 07:00:00 GMT

In article <3pgkmo$b3s@post.gsfc.nasa.gov>, thompson@orpheus.nascom.nasa.gov
(William Thompson) writes:

[...]
=I can't make it fail running IDL 3.6.1c under OSF/1 v2.0 on an AXP 3000/600
=workstation. I always get the result
=
= IDL> print, exp(complex(0,1)*sqrt(2.)*10.)^sqrt(2.)
= (-1.28269e-10, 1.66070e-10)
=
=no matter how many times I try it. (I assume that's the correct value.)

Nope. Just try

```
IDL> print, exp( complex(0,1)*sqrt(2.)*10. )^sqrt(2.D0)
(    -0.611276,     0.791417)
```

This gives the right value.

-xavier