Subject: Re: Strange floating-point precision behavior
Posted by tim on Sun, 09 Feb 2003 02:28:20 GMT
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In my haste I had neglected to do a proper search of this newsgroup's archives. I see now that double-precision values are inherently off by a small amount. Given that, I am looking for suggestions on how better to handle double-precision values so that I get exact results from my calculations.

Thanks.

On 8 Feb 2003, Tim Lloyd wrote:

> I have written a routine that converts Earth-Centered Inertial
> coordinates in x/y/z to geodetic latitude/longitude/altitude using the
> WGS84 standard. I have one issue, however, that I believe is
> affecting my calculations of altitude so that they are accurate only
> to 1-meter resolution. I am defining the ECI coordinates as
> double-precision:
>
> IDL> boulder={x:-1283388.8693d0, $
> y:-4713016.9053d0, $
> z:4090191.0471d0} ;Boulder, CO, GPS station
>
> and yet IDL seems to be storing the data incorrectly:
>
> IDL> print,boulder,format='(3f20.10)'
> -1283388.8692999999 -4713016.9052999998 4090191.0471000001
>
> What am I doing wrong? I am fairly certain that this behavior is
> responsible for my calculations yielding 1674.6658 m as the altitude
> of the Boulder GPS station, and not 1674.7428 m (the actual altitude).
> This is on IDL 5.6 for Mac OS X.
>
> Thanks,
> Tim Lloyd
> Laboratory for Atmospheric & Space Physics
>

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"The eyes of the world now look into space, to the moon and to the planets beyond, and we have vowed that we shall not see it governed by a hostile flag of conquest, but by a banner of freedom and peace."
-- John F. Kennedy