Subject: Arithmetic error
Posted by Ed Wright on Thu, 31 Jan 2002 00:31:56 GMT

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To: IDL
From: Ed Wright, JPL

I require assistance with an odd problem. My current projects involves creating a dlm module of some 200+ routines from a library of 1500+ routines. Several of the IDL callable routines replicate intrinsic IDL calls. While testing one such routine that calculates determinate of a 3X3 I encountered a problem. The numerical result between my determinant function and determn matches to 10^(-16).

Now the odd thing. Under certain circumstances the use of my determinant function as an argument in another routine call causes an error:

% Program caused arithmetic error: Floating illegal operand.

Code causing error:

```
cspice_eul2m, 30.d0, 60.d0, -15.d0, 3, 2, 1, mat1

cspice_chcksd, "Determinant of rotation matrix", cspice_det(mat1), $
          "~", 1.d0, LIMIT, ok
```

The first routine, cspice_eul2m, calculates a rotation matrix given the rotation angles and the sequence of axes. The second routine, cspice_chcksd, performs a tolerance test on the determinant of mat1, calculated by the function cspice_det(mat1).

If I replace cspice_det(mat1) with determ(mat1), no error. If I recast the code as:

```
cspice_eul2m, 30.d0, 60.d0, -15.d0, 3, 2, 1, mat1
det = cspice_det(mat1)

cspice_chcksd, "Determinant of rotation matrix", det , $
          "~", 1.d0, LIMIT, ok
```

no error results.

Also, a different sequence of rotations exhibits no error. I have several similar tests involving other matricies without error.

Any suggestions?

As always,

Ed Wright
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