
Subject: Puzzle with floating point underflow

Posted by [Martin Schultz](#) on Thu, 23 Aug 2001 07:30:35 GMT

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Hi all,

How can a float number be something e-42 if the system says it can only represent numbers down to 1.e-38 in a float????????

```
test= 8.1047657d-42
```

```
IDL> tmp=float(test)
```

```
% Program caused arithmetic error: Floating underflow
```

```
% Detected at MGS_RGRID::REGRID 203 /pf/m/m218003/home/IDL/lib/mgs_newobjects  
/mgs_rgrid__define.pro
```

```
IDL> help,tmp
```

```
TMP          FLOAT    = 8.10511e-42
```

```
IDL> help,machar(),/stru
```

```
** Structure MACHAR, 13 tags, length=52:
```

IBETA	LONG	2	
IT	LONG	24	
IRND	LONG	5	
NGRD	LONG	0	
MACHEP	LONG	-23	
NEGEP	LONG	-24	
IEXP	LONG	8	
MINEXP	LONG	-126	
MAXEXP	LONG	128	
EPS	FLOAT	1.19209e-07	
EPSNEG	FLOAT	5.96046e-08	
XMIN	FLOAT	1.17549e-38	<<<<<<<<<<<
XMAX	FLOAT	3.40282e+38	

(For those, who haven't figured this out from the Machar output: I am running IDL5.3 on a Linux system (kernel 2.2.14))

Not a real problem because underflows are considered harmless, but I am curious about this, anyhow.

Cheers,

Martin

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```

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```
