Subject: Re: Physical constants in IDL with !CONST
Posted by Russell Ryan on Thu, 20 Dec 2012 03:07:09 GMT
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Sounds cool and is a good idea. What if you have four tags:

name
description
value
unit

so you could have
!const={name:'c',description:'speed of light',value:2.99d10,unit:'cm/s'}

-Russell

On Tuesday, December 18, 2012 5:34:53 PM UTC-5, Chris Torrence wrote:
> Hi all,
>
>
>
> I'm adding a new system variable to IDL, called !CONST. So far, it's an IDL structure containing the following physical constants, in MKS units. All of these values (except for !const.pi, .e, .phi, and .R_earth) are taken from the "2010 CODATA Recommended Values," from NIST.
>
>
>
> Name Description Value
>
> alpha Fine structure constant 7.2973525698 x 10-3
>
> c Speed of light in a vacuum 299792458 m/s
>
> e Euler's number 2.7182818284590452
>
> ev elementary charge e, 1 electron volt 1.602176565 x 10-19 C
>
> eps0 electric vacuum permittivity 8.854187817 x 10-12 F/m
>
> F Faraday constant NAe 96485.3365 C/mol
>
> G Gravitation constant 6.67384 x 10-11 m3/kg/s2
>
> gn Earth standard gravity 9.80665 m/s2
>
> h Planck constant 6.62606957 x 10-34 J s
>
> hbar h/(2pi) 1.054571726 x 10-34 J s

>
> k Boltzmann constant R/NA 1.3806488 x 10-23 J/K
>
> me electron mass 9.10938291 x 10-31 kg
>
> mn neutron mass 1.674927351 x 10-27 kg
>
> mp proton mass 1.672621777 x 10-27 kg
>
> mu0 magnetic vacuum permeability 12.566370614 x 10-7 N/A2
>
> Na Avogadro constant NA 6.02214129e23 mol-1
>
> phi golden ratio 1.6180339887498948
>
> pi Pi 3.1415926535897932
>
> R molar gas constant 8.3144621 J/mol/K
>
> R_earth Earth radius (spherical) 6370997.0 m
>
> re classical electron radius 2.8179403267 x 10-15 m
>
> rydberg Rydberg constant Rinf 10973731.568539 m-1
>
> sigma Stefan-Boltzmann constant 5.670373 x 10-8 W/m2/K4
>
> u unified atomic mass unit 1.660538921 x 10-27 kg
>
>
>
> Here's my question: What am I missing? Are there any physical constants that most people would find useful for their day-to-day work. The key is "most" people - nothing too esoteric, or limited to a single scientific discipline, etc.
>
>
>
> Thanks!
>
>
>
> -Chris
>
> ExelisVis
>
> p.s. please limit your comments to !CONST. Our new widget system team is currently hard at work in a secret underground bunker, and cannot be disturbed.
