Manual for Package: physics
Revision 1:7M

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1 @Constant

1.1 Constant

```
Constant and physical standard quantities
```

1.2 celsius_to_kelvin

```
convert temperature from degree Celsius to Kelvin
function t_K = celsius_to_kelvin(t_C)
```

1.3 depth_to_pressure

```
convert depth to pressure in fresh water at standard temperature

   z = (p - p0)/(rho g)
=> p = rho g z + p0

input :
p0 : nx1 or scalar, pressure at water surface in BAR
d  : depth in metre

output :
p  : nx1, pressure at measurement depth in BAR
```

1.4 kelvin_to_celsius

```
convert temperature degree Kelvin to Celsius
```

1.5 optical_attenuation

1.6 pressure_to_depth

```
convert pressure to depth in fresh water at standard temperature

z = (p - p0)/(rho*g)

input:
p  : nx1, pressure at measurement depth in BAR
p0 : nx1 or scalar, pressure at water surface in BAR

output:
d  : depth in metre
```

1.7 saturation_vapor_pressure

1.8 sound_absorption_air

1.9 sound_absorption_water

```
sound absrobption in water
following Francois and Garrison, 1982


function alpha = sound_absorption(f,S,D,T)

input:
f : frequency (Hz)
S : salinity
D : depth (m)
T : temperature (degree C)

output:
alpha = sound attenuation in dB/m (not dB/km)

function alpha = sound_absorption(f,S,D,T,model)
```

1.10 sound_velocity_water

```
sound velocity in water
following Lubbers and Graaff (1998)
this formula does not include depth and salinity effects
```

1.11 viscosity_dynamic_water

1.12 viscosity_kinematic_water

2 physics

2.1 beam_bending_deflection

2.2 beam_bending_moment

2.3 beam_bending_strain

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3.3 hydrogen_spectrum_2d

3.4 hydrogen_spectrum_3d

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4.3 moment_of_inertia_ring

4.4 parabolic_reflector_gain

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